



TOXICITY OF INDUSTRIAL EFFLUENTS IN ONTARIO

January 1969 to
December 1979

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O57



Ministry
of the
Environment

The Honourable
Harry C. Parrott, D.D.S.,
Minister

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Deputy Minister

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1979

TOXICITY OF INDUSTRIAL EFFLUENTS

IN ONTARIO

JANUARY 1969 to DECEMBER 1979

Toxicity Unit Staff

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JANUARY 1969 - DECEMBER 1979

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PREFACE

"Chemical examination alone of a complex industrial waste does not provide sufficient information on their effects on the aquatic biota for the protection of the aquatic environment. Moreover, the toxicity of a complex mixture of wastes and chemicals cannot be determined by chemical means."⁽¹⁾

An organism exposed, under controlled conditions, to these mixtures will provide a summated biological response. Such an exposure is the static 96-hour bioassay.

This basic bioassay can answer a number of questions about a substance:

- "is it toxic?
- how toxic?
- does it vary in toxicity?
- what fraction of the waste is most toxic?
- is the available dilution sufficient to protect fish?
- how effective are treatment methods in reducing toxicity?" (2)

The fundamental elements of the basic, short-term bioassay consist of a series of containers holding dilutions of a toxicant, a container of dilution water, and time. An equal number of test animals (usually fish) are put into each container. The number of dead animals in each container is counted and removed at regular, pre-determined periods.

The unit of measurement of the short term bioassay is the median lethal concentration (LC-50). This value is the concentration which is lethal to 50% of the test animals. The LC-50 concentration always has a time qualification attached. Thus, a 96-hour LC-50 is a concentration of a toxicant that will kill half the test organisms in 96 hours. For example, the effluent from a fully bleached sulphate pulp mill might have a typical 96-hour LC-50 of 25% v/v. (A volume/volume dilution of the waste, 75% water/25% effluent will kill

half the test animals in 96 hours). It is important that the LC-50 not be confused with a "safe concentration" of a toxicant. Usually the safe concentration of a substance or effluent is obtained by multiplying the LC-50 value by an appropriate application factor. Generally, those substances or effluents which do not persist or do not bioaccumulate require less dilution (i.e. a numerically larger application factor) to be rendered harmless. Using ammonia as an example such an application factor would be $0.1 \times 96\text{-hour LC-50}$ or $0.1 \times 0.2 \text{ mg/L} = 0.02 \text{ mg/L}$.

Those substances or effluents which are more persistent or bioaccumulate will require much greater dilution (i.e. a numerically smaller application factor) to achieve a safe, no effect concentration in the environment. Such an application factor would be $0.01 \times 96\text{-hour LC-50}$. Substances in this category would be metals (zinc, mercury) and higher molecular weight chlorinated organics (PCB). The LC-50 itself, therefore, quantifies the potency of a waste (or lethality) and is valuable for comparison of processes, treatments or changes through time.

If an undiluted effluent kills less than half of the test animals in 96 hours then its LC-50 would be theoretically greater than 100% concentration. For practical purposes such an effluent is considered to be marginally lethal. To fully evaluate effluents of this type other bioassay methods involving chronic exposure and/or sub-lethal responses may be required.

More and more industrial and regulatory agencies are turning to the use of bioassays for monitoring and controlling discharges to the aquatic environment. The integrative nature of the test measures the lethality of all the toxicants present acting simultaneously.

National Standards of Effluent Control

The federal government has developed liquid effluent guidelines for a number of industrial sectors. These sectors are the chlor-alkali industry, the pulp and paper industry, the fish processing industry, the meat and poultry processing industry, the potato processing industry, the metal finishing industry and the

petroleum refining industry. Chlor-alkali plants, fish processing plants and metal finishing plants have no fish toxicity testing requirements. Legislation regulations for the remaining industries (pulp and paper, meat and poultry products, potato processing and petroleum refining) include minimum bioassay requirements for effluents.

These requirements are expressed in terms of regulations, guidelines and explanatory notes. The standards represent what the federal government expects of industries as a national minimum acceptable control level.

The regulation is a specific law that applies to all relevant situations. These regulations limit the amount of specific contaminants in effluents and define the frequency of monitoring and reporting.

A guideline is not a specific law. It is a statement indicating what practices will be considered by the Environmental Protection Service to be in compliance with the spirit of the law. Failure to comply with a guideline is not itself an offence; however, it may mean that the law itself (e.g. the general prohibition of deleterious discharges expressed in the Fisheries Act) is being violated.

The toxicity guidelines relate the acute lethality of an effluent to a species of fish and these requirements apply to every relevant plant whether new, expanded, or existing. Acute lethality tests involve exposing specified test organisms to samples of effluent under controlled conditions.

While the regulated industries must comply with the regulations from the day they came into force, the guidelines provide administrative flexibility needed to allow the regulatory agencies and the industries time to negotiate and implement a compliance schedule.

The guidelines are a series of notes and recommended best practices dealing with many of the technical aspects of effluent sampling, preparation of the bioassay sample, fish culture and bioassay management.

There are two basic types of bioassays to be run under these regulations and guidelines. The first test is a 24-hour static bioassay which, run monthly, is designed to inform the plant management of the general, overall efficiency of their effluent treatment system. The governing toxicity test is usually a 96-hour flow through test which is run by the Minister or his agent. The governing test is the one which will be used to establish the compliance of the effluent with the appropriate regulations and/or guidelines.

Metal Mining Liquid Effluent Regulations and Guidelines (3)

Guidelines for the Measurement of Acute Lethality in Liquid Effluents from Metal Mines.

Application

These guidelines apply to every Metal Mine except gold mines.

Objective - Governing Toxicity Test

For the purposes of these Guidelines the objective for each undiluted effluent deposited is that no more than 50% of the fish die in a composite sample within 96 hours when tested according to the procedure described as the Final Evaluation Test Procedure for Acute Lethality. This test is a 96-hour flow through bioassay.

Monitoring: Routine Toxicity Test

A Mine Operator should carry out an acute lethality test on a composite sample of each undiluted effluent deposited or have these tests carried out on his behalf in accordance with the test procedure described as Screening Test Procedure for Acute Lethality, every three months. This test is a 96-hour static bioassay.

Meat and Poultry Products Plant Liquid Effluent Regulations and Guidelines (4)

Application

The guidelines apply to every plant with facilities intended primarily for the slaughtering, dressing, processing or edible or inedible rendering of any meat or poultry products and associated livestock holding and receiving facilities and truck washing areas.

Objectives - Governing Toxicity Test

The effluent deposited by new, expanded or existing plant does not meet the objectives of these guidelines if more than 50% of the test fish die in a 96-hour flow through bioassay.

Monitoring - Routine Toxicity Test

The owner of a new, expanded or existing plant should conduct the acute lethality test on a composite sample as determined by the type and size of plant. The monitoring test is a 96-hour static bioassay.

Petroleum Refinery Effluent Regulations and Guidelines (5)

Application

These guidelines apply to all existing refineries.

Objective - Governing Toxicity Test

For the purpose of these Guidelines, refinery liquid effluent and one-through cooling water that is deposited is not acceptable if more than 50% of the fish die in the bioassay sample when tested according to the bioassay procedure. The governing toxicity test is to be a 96-hour flow-through bioassay.

Monitoring: Routine Toxicity Test

The owner of a refinery is requested to determine once a month or as requested by the Minister the acute toxicity of liquid effluent and once through cooling water being deposited by the refinery by carrying out 24-hour static bioassays. Compliance in this test is indicated by at least 50% survival rate of the fish in the bioassay sample.

Potato Processing Plant Liquid - Effluent Regulations and Guidelines (6)

Application

These guidelines apply to every potato processing plant.

Objective - Governing Toxicity Test

For the purpose of these guidelines the objective for each undiluted effluent deposited is that no more than 50% of the fish die in a composite sample within 96 hours when tested according to the Test Procedure for 96-hour Acute Lethality Continuous Flow Test.

Monitoring - Routine Toxicity Test

The owner of a plant should carry out an acute lethality test on a composite sample of each undiluted effluent deposited or have these tests carried out on his behalf, in accordance with the Test Procedure for 24-hour Acute Lethality Static Test. Compliance in this test is indicated by at least 50% survival rate of the fish in the bioassay sample.

Guidelines for the Pulp and Paper Effluent Regulations Promulgated Under the Fisheries Act. (7)

Application

These guidelines apply to all new, expanded, altered or existing mills.

Objective - Governing Toxicity Test

For the purpose of these guidelines the objective is for a mixture of 65% deposited effluent, 35% dilution water to permit at least 80% fish survival in a 96-hour flow through bioassay when tested according to the "Test for Determining Toxicity of Mill Effluent".

Monitoring - Routine Toxicity Test

Two monitoring bioassays are outlined for deposited effluents from the Pulp and Paper industry.

The first test is a 96-hour flow through test similar to the governing toxicity test but using fewer replications and fish. The second test can be either a 96-hour flow through bioassay or a 96-hour test with the test solutions renewed every 24 hours.

It is generally recommended that the first of the monitoring bioassays be run by the regulatory agency while the industry is encouraged to run the second test.

Provincial Standards of Effluent Control

Provincial or local governments may also impose more stringent standards than the federal requirements. The more stringent requirements will prevail.

The Ontario Water Resources Act; Chapter 332, Section 32(8) prohibits any municipality or person from discharging to water any substance that may impair water quality. Similarly, in the Ontario Environmental Protection Act Chapter 86, Section 14(9) no one may discharge anything to the natural environment that causes or is likely to cause injury or damage, to property, plant or animal life.

Under the Canada-Ontario accord, Ontario has agreed to establish and enforce effluent requirements at least as stringent as the agreed Federal baseline requirements. These requirements will apply immediately to all new or expanded production facilities and as rapidly as possible in all other cases.

The Toxicity Unit of the Water Resources Branch, Limnology and Toxicity Section, maintains facilities at the Rexdale laboratory to complete static and, depending on the logistics, flow through bioassay for the completion of these tests can be made by contacting the Toxicity Unit Laboratory at 416-248---3011.

Summary of Regulatory Bioassays

Industry	Bioassay	
	Monitoring Test	Governing Test
Metal Mining	96-hr Static	96-hr flow through
Meat & Poultry	96-hr Static	96-hr flow through
Petroleum Refinery	24-hr Static	96-hr flow through
Potato Processing	24-hr Static	96-hr flow through
Pulp and Paper	96-hr flow through*	96-hr flow through
	96-hr flow through**	
	or	
	96-hr Static, renewed**	

* test run by regulatory agency

** test run by industry

- 1) Standard Methods for the Examination of Water and Wastewater. 14th ed. 1975. Prepared and published jointly by: American Public Health Association, American Water Works Association, Water Pollution Control Federation.
- 2) The A.B.C.'s of Pollutant Bioassay Using Fish. John B. Sprague. Symposium on Environmental Monitoring, June, 1972. Annual Meeting of the American Society for Testing and Materials.

- 3) Metal Mining Liquid Effluent Regulations and Guidelines.
Fisheries and Environment Canada, Environmental Protection Service, Regulations Codes and Protocols. Report EPS 1-WP-77-1. Water Pollution Control Directorate, April 1977.
- 4) Meat and Poultry Products Plant Liquid Effluent Regulations and Guidelines. Fisheries and Environment Canada.
Environmental Protection Service, Regulations, Codes and Protocols Report E.P.S. 1-WP-77-2. Water Pollution Control Directorate, July, 1977.
- 5) Petroleum Refinery Effluent Regulations and Guidelines.
Environment Canada, Environmental Protection Service, Regulations and Codes and Protocols Report E.P.S. 1-WP-74-1. Water Pollution Control Directorate, January 1974.
- 6) Potato Processing Plant Liquid Effluent Regulations and Guidelines. Fisheries and Environment Canada,
Environmental Protection Service, Regulations Codes and Protocols Report E.P.S. 1-WP-77-4. Water Pollution Control Directorate, November, 1977.
- 7) Guidelines for the Pulp and Paper Effluent Regulations.
Environment Canada, Environmental Protection Service, Regulation Codes and Protocols Report E.P.S. 1-WP-77-2. Water Pollution Control Directorate, May, 1972.
- 8) The Ontario Water Resources Act. Revised Statutes of Ontario, 1970. Chapter 332. March 1977.
- 9) The Environmental Protection Act, 1971. Statutes of Ontario 1971. Chapter 86. October, 1976.

SECTION 1

INTRODUCTION

This record of waterborne industrial waste quality across the province has been compiled under one cover to provide a background for current effluent conditions. The data has been compiled from bioassay tests requested by regional staff, from January 1969 to December 1979. Chemical data, when available, was included. More detailed information would be held by the local regional office.

The review is designed to assist pollution abatement staff compare industrial waste quality through time and within similar industrial groups. This information will be updated at the end of each calendar year.

Locating Industrial Data

Information is separated into two sections.

1) Industry Description Sheets identify:

- company name
- location
- receiving water
- background history
- production output
- effluent flow rate
- chemistry
- comments

2) Bioassay Data Summary Sheets identify:

- company name
- location
- discharge
- test number
- sample date
- static 96 hour LC_{50} data
- continuous flow 96-hour LC_{50} data
- comments

Both sections list the industries alphabetically by name.

Indexes

All industries are listed in three indexes for easy cross reference.

- Index I - industries listed by region
- Index II - industries listed by process type
- Index III - industries ranked by lethality for each region
 - industries are ranked according to four categories of lethality from most lethal to non lethal

96-hour LC ₅₀	<10% v/v (most lethal)
	>10% v/v 50% v/v
	>50% v/v 100% v/v
	>100% v/v (non lethal)

- each industry was placed in the category of its most lethal effluent.

Application

This compendium is designed as a handbook for field use by industrial abatement officers, and to provide easy reference to similar processes for the province. New data may be entered by regional staff to update locale industrial profiles as it is generated.

Bioassay Sample Collection

Generally bioassay samples should be scheduled for testing by contacting the Toxicity Unit (416-248-3011) four weeks in advance. Allowance is made, however, for emergency situations such as spills and fish kills.

Contingency containers should be kept on hand by regional staff for emergency use. Five gallon (20 L) plastic containers will suffice provided they withstand handling during transport. Containers should be rinsed with sample, filled to capacity to exclude air, and kept cool (4°C) if possible. All containers should be labelled indicating company name, location, sample site, date and collection personnel.

A minimum of 20 gallons of sample are required for a regulatory 96-hour static LC₅₀ test using rainbow trout. Smaller volume samples may be tested using other aquatic organisms but should be submitted only when larger volume collections are impossible or impractical. It must be emphasized, however, that small volume samples may produce logistic difficulties which would affect interpretation of the results.

Long-term industrial survey programs may be planned in advance with Toxicity Unit staff in order that major blocks of laboratory time are made available. Bioassay testing protocols can be designed to meet specific needs, as well as to identify and to evaluate the contribution of toxicants in industrial wastes. Recent programs have incorporated a task force approach involving regional staff, laboratory services analytical groups and the Toxicity Unit to provide a more comprehensive investigation.

Acknowledgements

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SECTION 2INDEX 1
Industries Identified by RegionCENTRAL REGION (C)

Alchem Chemical Co. Ltd.	Burlington
Ashland Oil Co. Ltd.	Mississauga
Borg-Warner	Coburg
British Petroleum (BP)	Bronte
Chemical Development of Canada Co. Ltd.	Longford Mills
Douglas Aircraft	Malton
Gulf Oil	Clarkson
Houdaille Plating Co. Ltd.	Oshawa
Lindsay S.T.P.	Lindsay
P. L. Robertston Co. Ltd	Milton
Shell Canada	Oakville
Skyway S.T.P.	Burlington
Union Carbide	Lindsay

SOUTHEASTERN REGION (SE)

Alexandria Municipal Discharge	Alexandria
Ault's Foods	Winchester
Bakelite Thermosets (formerly Union Carbide)	Belleville
Bell Northern Research	Ottawa
Canada Starch	Cardinal
Canadian Industries Ltd. (C.I.L.)	Cornwall
Canadian International Paper (C.I.P.)	Hawkesbury
Celanese	Cornwall
Celanese	Millhaven
Chromasco	Haley Station
Collie Woollen Mills	Appleton
Consolidated Textiles	Alexandria
Corby Distillery	Corbyville
Cornwall Chemicals	Cornwall
Cornwall Municipal Discharge	Cornwall
Courtaulds	Cornwall
Deloro Smelting and Refining	Deloro
Domtar Chemicals	Trenton
Domtar Fine Papers	Cornwall
Domtar Packaging	Trenton
Dow Badishe	Arnprior
Dupont	Kingston
Dupont	Maitland
Dusseck Brothers	Belleville
E. B. Eddy Forest Products	Ottawa
Genstar	Brockville
Haley Industries	Haley Station
Hawkesbury Municipal Discharge	Hawkesbury
Iroquois Municipal Discharge	Iroquois
ITEA Textiles	Cornwall
Kraft Foods	Ingleside
Madawaska Mines	Bancroft
Nestle's Foods	Chesterville

Rohm and Haas
 Strathcona Paper
 Transparent Cellulose Film (T.C.F.)
 Trent Valley Paper
 Zephyr Textiles

Morrisburg
 Strathocona
 Cornwall
 Glen Miller
 Almonte

NORTHEASTERN REGION (NE)

Abitibi Paper Co. Ltd.
 Abitibi Paper Co. Ltd.
 Abitibi Paper Co. Ltd.
 Abitibi Paper Co. Ltd.
 Agnew Lake Mine
 Agnico Eagle
 Algoma Steel
 Beaver Charcoal
 Canadaka Mines
 Canadian Industries Ltd. (C.I.L.)
 Canadian Industries Ltd. (C.I.L.)
 Canadian Smelting and Refining
 Cobalt Camp
 Cochrane Enterprises
 Denison Mines
 Denison Mines
 Dupont
 E. B. Eddy Forest Products
 Falconbridge
 Falconbridge
 Falconbridge
 Inco
 Inco
 Inco
 Inco
 Kamkotia Mine
 Kanichee
 Lacours Lumber
 Rio Algom
 Rio Algom
 Rio Algom
 Rio Algom
 Rio Algom
 Sherman Mine
 Spruce Falls Power & Paper Co.
 Teck Corporation
 Texagulf

Iroquois Falls
 Sault Ste Marie
 Smooth Rock Falls
 Sturgeon Falls
 Agnew Lake
 Glenn Lake
 Sault Ste Marie
 North Bay
 Elliot Lake
 Parry Sound
 Sudbury
 North Bay
 Farr Creek
 Cochrane
 Stanrock
 Denison Property
 North Bay
 Espanola
 Emery Creek
 Fecunis Creek
 Moose Lake
 Coniston
 Copper Cliff
 Nolin's Creek
 Levack
 Timmins
 Temagami
 Lakstock
 Crotch Lake
 Nordic Property
 Pronto Property
 Quirke Property
 Strike Lake
 North Bay
 Kapuskasing
 Cart Lake
 Porcupine R.

NORTHWESTERN REGION (NW)

Abitibi Forest Products Ltd.
 Abitibi Paper Co. Ltd.
 Abitibi Provincial
 American Can of Canada
 Boise-Cascade
 Boise-Cascade
 Bulore Mine
 Campbell-Red Lake

Fort William
 Thunder Bay
 Port Arther
 Marathon
 Fort Frances
 Kenora
 Red Lake
 Red Lake

Cochenour-Williams
 Dickenson Gold Mines
 Domtar Packaging
 Great Lakes Forest Products
 Inco
 Industrial Grain Products
 Kimberly-Clark of Canada
 Noranda Mines
 Northern Wood Preservers
 Reed Paper
 Reichbold Chemicals

Red Lake
 Balmer Lake
 Red Rock
 Thunder Bay
 Shebondowan
 Thunder Bay
 Terrace Bay
 Geco
 Thunder Bay
 Dryden
 Thunder Bay

SOUTHWESTERN REGION (SW)

Allied Chemicals
 B.A.S.F.
 Canadian Industries Ltd. (C.I.L.)
 Chrysler of Canada
 Dow Chemical
 Dupont of Canada
 Ethyl Corporation
 Fiberglass of Canada
 Ford of Canada
 Ford of Canada
 Freedland Industries
 Imperial Oil (Petrochemical)
 Imperial Oil (Refinery)
 Luster Division, National Hardware
 Monsanto Co. Ltd.
 Petrosar
 Polysar
 Shell Canada
 Sun Oil
 Tricil
 Windsor Bumper Co.
 Windsor Chrome Plating

Amherstburg
 Wyandotte, Michigan
 Courtright
 Windsor
 Corunna
 Corunna
 Corunna
 Sarnia
 St. Thomas
 Windsor
 Kingsville
 Sarnia
 Sarnia
 Wallaceburg
 Sarnia
 Sarnia
 Sarnia
 Corunna
 Corunna
 Corunna
 Windsor
 Windsor

WEST-CENTRAL REGION (WC)

Abitibi Provincial Paper
 Atlas Steel
 Beaver Woodfibre
 B. F. Goodrich
 Cyanamid
 Dofasco
 Elmira S.T.P.
 General Motors
 Hahn Brass
 Kimberly-Clark of Canada
 Ontario Paper
 Paris Municipal Treatment Plant
 Penman's Textiles
 Stelco
 Texaco
 Uniroyal

Thorold
 Welland
 Thorold
 Niagara
 Welland
 Hamilton
 Elmira
 St. Catherines
 New Hamburg
 St. Catherines
 Thorold
 Paris
 Paris
 Hamilton
 Nanticoke
 Elmira

SECTION 3

INDEX II

Industry Grouping by Basic Process Type

Pulp and Paper

Abitibi Paper Co. Ltd.	Fort Williams
Abitibi Paper Co. Ltd.	Iroquois Falls
Abitibi Paper Co. Ltd.	Sault Ste Marie
Abitibi Paper Co. Ltd.	Smooth Rock Falls
Abitibi Paper Co. Ltd.	Sturgeon Falls
Abitibi Paper Co. Ltd.	Thunder Bay
Abitibi Paper Co. Ltd.	Port Arthur
Abitibi Provincial Paper	Thorold
Abitibi Provincial Paper	Marathon
American Can of Canada	Thorold
Beaver Wood Fiber Co. Ltd.	Fort Frances
Boise-Cascade	Kenora
Boise-Cascade	Hawkesbury
Canadian International Paper co. Ltd. (C.I.P.)	Cornwall
Domtar Fine Papers Co. Ltd.	Red Rock
Domtar Packaging Co. Ltd.	Trenton
Domtar Packaging Co. Ltd.	Espanola
E. B. Eddy Forest Products	Ottawa
E. B. Eddy Forest Products	Thunder Bay
Great Lakes Paper Co. Ltd.	St. Catherines
Kimberly-Clark of Canada	Terrace Bay
Kimberly-Clark of Canada	Thorold
Ontario Paper Co. Ltd.	Dryden
Reed Paper Co. Ltd.	Kapuskasing
Spruce Falls Power and Paper Co.	Glen Miller
Strathcona Paper Co. Ltd.	

Basin Iron and Steel

Algoma Steel	Sault Ste Marie
Atlas Steel	Welland
Dofasco (Dominion Foundry and Steel)	Hamilton
Stelco (Steel Co. of Canada Ltd.)	Hamilton

Mining and Metallurgical

Agnew Lake Mine	Agnew Lake
Agnico Eagle	Glenn Lake
Bulore Mine	Red Lake
Campbell-Red Lake Mine	Red Lake
Canadaka Mines	Elliot Lake
Canadian Smelting and Refining	North Bay
Cobalt Camp	Farr Creek
Cochénour-Williams Mine	Red Lake
Deloro Smelting and Refining	Deloro
Denison Mines	Denison Property
Denison Mines	Stanrock Property
Dickenson Gold Mines	Balmer Lake

Mining and Metallurgical (cont'd)

Falconbridge

Falconbridge

Falconbridge

Inco

Inco

Inco

Inco

Inco

Kamkotia Mine

Kanichee Mine

Noranda Mines

Rio Algom Mines

Rio Algom Mines

Rio Algom Mines

Rio Algom Mines

Rio Algom Mines

Sherman Mine

Teck Corp.

Texagulf Corp.

Emery Creek

Fecunis Creek

Moose Lake

Coniston

Copper Cliff

Levack

Nolin's Creek

Shebandowan

Timmins

Temagami

Geco

Crotch Lake

Nordic Property

Pronto Property

Quirke Property

Strike Land

North Bay

Cart Lake

Porcupine River

Food Processing

Ault's Foods

Canada Starch

Corby Distillery

Industrial Grain Products

Kraft Foods

Nestle's Foods

Winchester

Cardinal

Corbyville

Thunder Bay

Ingleside

Chesterville

Miscellaneous - Automotive

Chrysler of Canada

Ford of Canada

Ford of Canada

General Motors

Windsor

St. Thomas

Windsor

St. Catherines

- Electroplating

Chromasco

Freedland Industries

Hahn Brass

Haley Industries

Houdaille Plating Co. Ltd.

Luster Division, National Hardware

P. L. Robertson Co. Ltd.

Windsor Bumper Co.

Windsor Chrome Plating

Haley Station

Kingsville

New Hamburg

Haley Station

Oshawa

Wallaceburg

Milton

Windsor

Windsor

- Textiles

Celanese

Celanese

Collie Woollen Mills

Consolidated Textiles

Cornwall

Millhaven

Appleton

Alexandria

Courtaulds
 ITEA Textiles
 Penman's Textiles
 Transparent Cellulose Film (T.C.F.)
 Zephyr Textiles

Cornwall
 Cornwall
 Paris
 Cornwall
 Almonte

- Service Industries

Alexandria Municipal Discharge
 Cornwall Municipal Discharge
 Dussek Brothers
 Elmira Municipal Discharge
 Hawkesbury Municipal Discharge
 Iroquois Municipal Discharge
 Lindsay S.T.P.
 Paris S.T.P.
 Skyway S.T.P.
 Tricil

Alexandria
 Cornwall
 Belleville
 Elmira
 Hawkesbury
 Iroquois
 Lindsay
 Paris
 Burlington
 Windsor

- Others

Bakelite Thermosets
 Beaver Charcoal
 Bell Northern Research
 Cochrane Enterprises
 Douglas Aircraft
 Lacours Lumber
 Northern Wood Preservers

Belleville
 North Bay
 Ottawa
 Cochrane
 Malton
 Lakstock
 Thunder Bay

Chemical Manufacturing (including organic compounds, inorganic compounds, petrochemicals, polymers, fertilizers and acids)

Alchem Chemical Co. Ltd.
 Allied Chemical Co. Ltd.
 Ashland Oil
 B.A.S.F.
 B. F. Goodrich
 Borg-Warner
 British Petroleum (BP)
 Canadian Industries Ltd. (C.I.L.)
 Canadian Industries Ltd. (C.I.L.)
 Canadian Industries Ltd. (C.I.L.)
 Canadian Industries Ltd. (C.I.L.)
 Chemical Developments of Canada
 Cornwall Chemicals
 Cyanamid of Canada
 Domtar Chemicals
 Dow Badische
 Dow Chemicals
 Dupont of Canada
 Dupont of Canada
 Dupont of Canada
 Dupont of Canada
 Ethyl Corp.

Burlington
 Amherstburg
 Mississauga
 Wyandotte, Michigan
 Niagara
 Coburg
 Bronte
 Cornwall
 Corunna
 Parry Sound
 Sudbury
 Longford Mills
 Cornwall
 Welland
 Trenton
 Arnprior
 Sarnia
 Corunna
 Kingston
 Maitland
 North Bay
 Corunna

Chemical Manufacturing (cont'd)

Fiberglass of Canada	Sarnia
Genstar	Brockville
Gulf Oil	Clarkson
Imperial Oil (Pertochemical)	Sarnia
Imperial Oil (Refinery)	Sarnia
Monsanto Co. Ltd.	Sarnia
Petrosar	Sarnia
Polysar Corp.	Sarnia
Reichbold Chemicals	Thunder Bay
Rohm and Haas	Morrisburg
Shell Canada	Corunna
Shell Canada	Oakville
Sun Oil	Corunna
Texaco	Nanticoke
Union Carbide	Lindsay
Uniroyal Co. Ltd.	Elmira

SECTION 4

INDEX III

Regional Industries Identified by their most Toxic Final Discharge
(most recent representative sample)

CENTRAL REGION (C)96 hour LC50 <10% v/v

Chemical Development of Canada
Houdaille Plating
Ashland Oil

Longford Mills
Oshawa
Mississauga

96 hour LC50 >10% v/v < 50% v/v

Borg-Warner
Union Carbide

Coburg
Lindsay

96 hour LC50 >100% v/v

Alchem Co.
British Petroleum (BP)
Douglas Aircraft
Gulf Oil
P. L. Robertson Co. Ltd.
Shell Canada
Skyway S.T.P.

Burlington
Bronte
Malton
Clarkson
Milton
Oakville
Burlington

NORTHEASTERN REGION (NE)96 hour LC50 <10% v/v

Abitibi Paper Co. Ltd.
Abitibi Paper Co. Ltd.
Algoma Steel
Beaver Charcoal
Cochrane Enterprises
E. B. Eddy
Inco
Kamkotia Mine
Rio Algom

Iroquois Falls
Sturgeon Falls
Sault Ste Marie
North Bay
Cochrane
Espanola
Nolin's Creek
Timmins
Crotch Lake

96 hour LC50 >10% v/v < 50% v/v

Abitibi Paper Co. Ltd.
Abitibi Paper Co. Ltd.
Canadian Industries Ltd. (C.I.L.)
Denison Mines
Falconbridge
Inco
Rio Algom Mines
Sherman Mine
Spruce Falls Power and Paper Co.

Sault Ste Marie
Smooth Rock Falls
Sudbury
Stanrock
Fecunis Lake
Copper Cliff
Strike Lake
North Bay
Kapuskasing

NORTHEASTERN REGION (NE) (cont'd)96 hour LC50 > 50% v/v < 100% v/v

Canadian Industries Ltd. (C.I.L.)
 Denison Mines
 Lacours Lumber

Parry Sound
 Denison Property
 Lakestock

96 hour LC50 > 100% v/v

Agnew Lake Mine
 Agnico Eagle
 Canadaka Mines
 Canadian Smelting & Refining
 Cobalt Camp
 Dupont
 Falconbridge
 Falconbridge
 Inco
 Inco
 Kanichie Mine
 Rio Algom Mines
 Rio Algom Mines
 Rio Algom Mines
 Teck Corporation
 Texagulf

Agnew Lake
 Glenn Lake
 Elliot Lake
 North Bay
 Farr Creek
 North Bay
 Emery Creek
 Moose Lake
 Coniston
 Levack
 Temagami
 Nordic Property
 Pronto Property
 Quirke Property
 Cart Lake
 Porcupine River

NORTHWESTERN REGION (NW)96 hour LC50 < 10% v/v

Abitibi Forest Products
 Boise-Cascade
 Campbell-Red Lake Mine
 Industrial Grain Products
 Noranda Mines

Fort William
 Fort Frances
 Red Lake
 Thunder Bay
 Geco

96 hour LC50 > 10% v/v < 50% v/v

Abitibi Paper Co. Ltd.
 Great Lakes Paper Co.
 Kimberly-Clark
 Reed Paper

Thunder Bay
 Thunder Bay
 Terrace Bay
 Dryden

96 hour LC50 > 50% v/v < 100% v/v

American Can of Canada
 Boise-Cascade

Marathon
 Kenora

96 hour LC50 > 100% v/v

Abitibi Provincial Paper
 Bulore Mine
 Cochenour-Williams Mine
 Domtar Packaging
 Inco
 Northern Wood Preservers
 Reichbold Chemicals

Port Arthur
 Red Lake
 Red Lake
 Red Rock
 Shebandowan
 Thunder Bay
 Thunder Bay

SOUTHEASTERN REGION (SE)96 hour LC50 <10% v/v

Consolidated Textiles	Alexandria
Courtaulds	Cornwall
Genstar	Brockville
Transparent Cellulose Film (T.C.F.)	Cornwall

96 hour LC50 >10% v/v <50% v/v

Aults Foods	Winchester
Canadian International Paper (C.I.P.)	Hawkesbury
Chromasco	Haley Station
Collie Woolen Mills	Appleton
Domtar Packaging	Trenton
Dussek Brothers	Belleville
Haley Industries	Haley Station
Iroquois Municipal Discharge	Iroquois
ITEA Textiles	Cornwall
Strathcona Paper	Strathcona
Zephyr Textiles	Almonte

96 hour LC50 >50% v/v <100% v/v

Canadian Industries Ltd. (C.I.L.)	Cornwall
Cornwall Municipal Discharge	Cornwall
Deloro Smelting and Refining	Deloro
Domtar Fine Papers	Cornwall
Dupont	Maitland
E. B. Eddy Forest Products	Ottawa
Hawkesbury Municipal Discharge	Hawkesbury

96 hour LC50 >100% v/v

Alexandria Municipal Discharge	Alexandria
Bakelite Thermosets	Belleville
Bell Northern Research	Ottawa
Canada Starch	Cardinal
Celanese	Cornwall
Celanese	Millhaven
Corby's Distillery	Corbyville
Cornwall Chemicals	Cornwall
Comtar Chemicals	Trenton
Dow Badische	Arnprior
Dupont	Kingston
Kraft Foods	Ingleside
Madawaska Mines	Bancroft
Nestles	Chesterville
Rohm and Haas	Morrisburg
Trent Valley	Glen Miller

SOUTHWESTERN REGION (SW)96 hour LC50 < 10% v/v

B.A.S.F.
Dow Chemicals
Monsanto

Wyandotte, Michigan
Corunna
Sarnia

96 hour LC50 > 10% v/v < 50% v/v

Allied Chemicals
Tricil

Amherstburg
Sarnia

96 hour LC50 > 50% v/v < 100% v/v

Chrysler of Canada
Ford of Canada
Freedland Industries
Imperial Oil (Petrochem.)
Polysar Corp.
Windsor Bumper Co.

Windsor
Windsor
Kingsville
Sarnia
Sarnia
Windsor

96 hour LC50 > 100% v/v

Canadian Industries Ltd. (C.I.L.)
Dupont of Canada
Ethyl Corp.
Fiberglass of Canada
Ford of Canada
Imperial Oil (Refinery)
Luster Division, National Hardware
Petrosar
Shell Oil
Sun Oil
Windsor Chrome Plating

Corunna
Corunna
Corunna
Sarnia
St. Thomas
Sarnia
Wallaceburg
Sarnia
Corunna
Corunna
Windsor

WEST-CENTRAL REGION (WC)96 hour LC50 < 10% v/v

Cyanamid of Canada
Penman's Textiles
Stelco

Welland
Paris
Hamilton

96 hour LC50 > 10% v/v < 50% v/v

Abitibi Provincial Paper
Paris Municipal Treatment Plant
Uniroyal

Thorold
Paris
Elmira

96 hour LC50 > 50% v/v < 100% v/v

Beaver Woodfiber
Elmira S.T.P.
Hahn Brass
Kimberly-Clark of Canada

Thorold
Elmira
New Hamburg
St. Catherines

WEST-CENTRAL REGION (WC) (cont'd)96 hour LC50 >100% v/v

Atlas Steel
B. F. Goodrich
Dofasco
General Motors
Ontario Paper
Texaco

Welland
Niagara
Hamilton
St. Catharines
Thorold
Nanticoke

NAME: ABITIBI PAPER COMPANY LIMITED,
FORT WILLIAM DIVISION

LOCATION: Fort William (NW)

RECEIVING WATER: Mission River to Lake Superior

BACKGROUND HISTORY: See Thunder Bay Division
1977 - MOE issues Control Order to improve
liquid effluents by 1980.

PRODUCTION OUTPUT: 100,000 metric tons/year of newsprint.

EFFLUENT FLOW RATE: Effluents are passed through a series of
lagoon to remove settalable solids.

CHEMISTRY: BOD₅ - 27,000 kg/day
Suspended Solids - 1,000 kg/day
Dissolved Solids - 54,000 kg/day

COMMENTS:

NAME: ABITIBI PAPER CO. LTD. SAULT STE MARIE

LOCATION: Sault Ste Marie (NE)

RECEIVING WATER: St. Marys River

BACKGROUND HISTORY: ~ 1900 begin operation - Producing regular and speciality grade newsprint
 1974 - Oct - Sulphite/groundwood process changed to draft/groundwood proces
 1974 - control order issued requiring reduced suspended solids loadings to less than 5 BD tons/day
 1975-76 (July - Feb) - Strike delays implementation of primary treatment
 1978 - Primary treatment running 90%

PRODUCTION OUTPUT: This mill produces paper at an average annual rate of 95,000 tons. 1977 figures quote production as 375 tons/day

EFFLUENT FLOW RATE: The discharge sampled for toxicity testing was the Freshwater sewer. Its rate of flow is 5-6 MGPD. 1977 figures show that 13 BD tons/day were sewered

CHEMISTRY:

pH	=	6.5
Suspended Solids	=	490 mg/L
Dissolved Solids	=	515 mg/.
BOD	=	190 mg/L
COD	=	1040 mg/L
SO ₄	=	120 mg/L
Phenols	=	15 ppb
Fe	=	120 mg/L

COMMENTS: Further mechanical changes, the addition of floating agents etc. should improve the operation and resultant effluent quality to within MOE objectives.

NAME: ABITIBI FOREST PRODUCTS LTD.

LOCATION: Sturgeon Falls (NE)

RECEIVING WATER: Sturgeon River to Lake Nipissing

BACKGROUND HISTORY: 1977 - MOE issued control order requiring effluent improvements by 1982.

PRODUCTION OUTPUT: 242 ADT corrugating medium
113 ADT Hardboard

EFFLUENT FLOW RATE: 3.1 MIGD

CHEMISTRY: BOD₅ - 41,200 kg/day
Suspended Solids - 6,700 kg/day

COMMENTS:

NAME: ABITIBI FOREST PRODUCTS LTD., - THUNDER BAY DIVISION

LOCATION: Thunder Bay (NW)

RECEIVING WATER: Lake Superior

BACKGROUND HISTORY:

- 1912 - Company incorporated initially as Abitibi Pulp and Paper Co.
- 1914 - Company re-incorporated
- 1928 - Acquired Spanish River Pulp & Paper Mills Ltd., Fort William Power Co. Ltd., Manitoba Paper Co. Ltd., St. Anne Paper Co. Ltd., Murray Bay Paper Co. Ltd.,
- 1932 - Acquired entire capital stock of Thunder Bay Co. Ltd.,
- 1955 - Abitibi Corp. formed in Delaware, U.S.A.
- 1960 - Acquires Pembroke Shook Mills Ltd.
- 1963 - U.S. plant acquires two other paper companies.
- 1963 - Acquires Maple Leaf Veneer
- 1965 - Name changed to Abitibi Paper Co.
- 1967 - Acquires controlling interest in City Papers Ltd.,
- 1968 - Acquires all shares of Hilroy Envelope and Stationery Ltd., Cox Newsprint and Cox Woodlands Ltd.,
- 1970 - Acquires Neville Papers
- 1971 - More name changes and amalgamations incorporating Thunder Bay newspring mill division.
- 1977 - MOE issues a control order to improve BOD and solids by 1982

PRODUCTION OUTPUT: Newsprint manufacturing plant produces 161,500 metric tons/year.

EFFLUENT FLOW RATE: Final outfall in Lake Superior.

CHEMISTRY:

BOD ₅	-	26,000 kg/day
Suspended Solids	-	2,200 kg/day
Dissolved Solids	-	66,000 kg/day

COMMENTS:

NAME: ABITIBI PROVINCIAL PAPER

LOCATION: Thunder Bay (NW)

RECEIVING WATER: Lake Superior

BACKGROUND HISTORY: See Thunder Bay Division
1977 - MOE issues control order to improve
liquied effluents by 1980.
1978 - Sulfite mill shut down to reduce
BOD₅ loading.
- Purchased pulp now used

PRODUCTION OUTPUT: 95,500 metric tons/year from the fine paper
mill.

EFFLUENT FLOW RATE: Effluents are passed through a lagoon system
to remove settalable solids

CHEMISTRY: BOD₅ - 2,800 kg/day
Suspended Solids - 2,800 kg/day
Dissolved Solids - 86,000 kg/day

COMMENTS:

NAME: ABITIBI PROVINCIAL PAPER LIMITED (Subsidiary of Abitibi Paper Co. Ltd.,)

LOCATION: Thorold (WC)

RECEIVING WATER: Old Welland Canal

BACKGROUND HISTORY: Plant started operation in 1902. Most recent addition is the #7 paper machine in 1961.

PRODUCTION OUTPUT: 225 A.D.I./D of fine paper. 24 hours/day 6 days/week

EFFLUENT FLOW RATE: 5.25 MIGD

CHEMISTRY: The mill runs mainly on waste paper. The major processes include repulping, bleaching (Cl_2 and NaHClO_3), cleaning, refining and sheet formation. Some purchased pulp is used as well. Major contaminants included B.O.D., C.O.D., solids, free chlorine, and PCB's (1 ppb).

BOD ₅	-	6,400 kg/day
Suspended Solids	-	3,150 kg/day

COMMENTS: Removal of the free chlorine from the effluent removes most but not all of the effluent lethality. The plant is presently under a control order to bring its effluent into compliance with Ministry guidelines.

NAME: ALGOMA STEEL CORPORATION - Sault Ste Marie

LOCATION: Sault Ste Marie (NE)

RECEIVING WATER: St. Marys River

BACKGROUND HISTORY:

- 1900 - began operation
- 1960 - OWRC begins work with Algoma to improve effluent quality of their outfalls
- 1971 - MOE continues monitoring of Algoma outfalls and establishes objectives for Terminal Basin and Dorr Thickener effluent quality.
- 1973 - Installation of Basin Oxygen Furnace
- 1971 - 75 - Installation of settling basins for Tube Mill, Cold Mill, 166¹¹ Plate Mill, Bar and Strip Terminal basins. Terminal Basin serves as suspended solid and oil recovery facility for contaminants in the effluents from Rolling Mills, Coke ovens and Coke Quench.
- 1975 - Installation of #7 Blast furnace
- 1975 - Ministerial Order to reduce concentration of contaminants bringing the Terminal Basin to designated levels.
- 1977 - Algoma operating Coke Oven By-Product Plant in an effort to meet standards of 1975 order.

PRODUCTION OUTPUT: The 1977 total raw steel production at Algoma Steel was 2.97 million tons.

EFFLUENT FLOW RATE: The combined flow of all discharges from Algoma Steel is 116.5 MGD

Bar and strip	= 13 MGD
Dorr Thickener	= 15.8
60" B.F. Sewer	= 14.4
30" B.F. Sewer	= 4.3
Cold Mill Oil Basin	= 3.0
Cold Mill Acid Sewer	= 2.0
Terminal Basin	= 62.0

CHEMISTRY:

COMMENTS: Due to the tremendous volumes of discharge the environmental impact of effluents from this industry are great.

NAME: ALLIED CHEMICAL OF CANADA LTD.

LOCATION: Amherstburg (SW)

RECEIVING WATER: Detroit River

BACKGROUND HISTORY: Soda ash production started at this site around 1910. In 1971 a facility was added for the manufacture of hydrofluoric acid. An effluent treatment system was added in 1957.

PRODUCTION OUTPUT: Confidential

EFFLUENT FLOW RATE: 31,680,000 MIGD

CHEMISTRY: Soda ash produced by the Solvay process
 $\text{CaCO}_3 + 2\text{NaCl} \rightarrow \text{Na}_2\text{CO}_3 + \text{CaCl}_2$
Hydrofluoric acid is also made by reacting fluorospar with oleum and sulphuric acid. Major contaminants include suspended and dissolved solids, ammonia, chlorides, fluorides

COMMENTS: Presently the company is recovering some CaCl_2 for dust control on loose surfaced roads. However, this plant represents a major source (approximately 1.8 million pounds/day) of chloride into the lower Great Lakes. There does not as yet seem to be a practical answer for the control of these dissolved solids.

NAME: ATLAS STEEL COMPANY

LOCATION: Welland (WC)

RECEIVING WATER: Welland River

BACKGROUND HISTORY: The plant which is a subsidiary of Rio Algom has been in operation for at least 50 years. In 1954 a continuous casting machine was added.

PRODUCTION OUTPUT: 18,000 tons of steel per month

EFFLUENT FLOW RATE: 11.3 MIGD

CHEMISTRY: The basic processes include electric arc furnaces to melt the scrap iron plus a variety of casting, rolling, annealing, cleaning and pickeling equipment*. Major contaminants are mainly iron and suspended solids

* This plant is concerned with producing a wide variety of specialty grades of stainless steel

COMMENTS:

NAME: B.A.S.F.

LOCATION: Wyandotte, Michigan (SW)

RECEIVING WATER: Detroit River

BACKGROUND HISTORY: Soda ash production started at this site before the turn of the century. In the late 1960's a propylene oxide plant was added. The waste treatment and control started in late 1930's.

PRODUCTION OUTPUT: Confidential

EFFLUENT FLOW RATE: 9 MIGD. Discharged from Fighting Island

CHEMISTRY: Soda ash produced from the Solvag process
 $\text{CaCO}_3 + 2 \text{NaCl} \rightarrow \text{Na}_2 \text{CO}_3 + \text{CaCl}_2$.

Propylene oxide using the chlorohydrin method is also made.

Major contaminants include chlorides, ammonia, fluoride and organics (propylene oxide and propylene chlorohydrin)

COMMENTS: This plant represents a major source of chloride into the Lower Great Lakes. There does not as yet seem to be a practical answer for the control of these dissolved solids.

NAME: BEAVER CHARCOAL, CHARCOAL SALES & SUPPLY OF ONTARIO

LOCATION: South River, North Bay (NE)

RECEIVING WATER: South River

BACKGROUND HISTORY:

- 1900 - start up of charcoal production process
- 1964 - OWRC survey showed phenols = 70,000 ppb, BOD = 8,000, pH = 2.9
- 1966 - Plant closed down
 - OWRC survey showed phenol = 500 ppb
 - OWRC sends a letter to company recommending pond excavation
- 1974 - MOE involvement due to complaint regarding tar deposits in Forest Lake
 - MOE water quality survey
 - MOE requests company to clean up; their response is negative
 - MOE-MNR joint cleanup of Forest Lake
- 1975 - MOE water quality survey
 - no company support for clean-up
- 1976 - MOE surveys on water quality and sediment
 - Further letters to company requesting removal of contaminated pond sludge
 - Company acknowledges awareness of contamination in pond
- 1977 - MOE survey continues
 - Company advises that cleanup completed over summer
 - MOE toxicity tests
 - MST for 100% = 1/2 hr.
 - MST for 10% = 36 hr
 - no evidence of cleanup by end of year

PRODUCTION OUTPUT: Charcoal manufacturing plant closed 1967-68.

EFFLUENT FLOW RATE: Effluent from defunct waste holding pond drains to the South River. There is not information on rate of flow.

CHEMISTRY:

- phenol (pond) = 38,772 ppb (average of values available 64 - 77)
- distillation condensate waste
- BOD - 8,000 ppm
- Solids - Dried = 4440 ppm
 - SS = 32 ppm
 - DS = 4408 ppm
 - Inverted = 14 ppm
 - loss = 4426 ppm
- pH - 2.9
- phenolic - 70,000 ppb

COMMENTS: This is an inactive site. All data collected was for purposes of MOE use to determine level of contamination and persuade company to clean up site

NAME: BEAVER WOODFIBER CO. LTD.

LOCATION: Thorold (WC)

RECEIVING WATER: Beaverdam Creek

BACKGROUND HISTORY: Paper and paper products have been produced at this site since before 1900. The present company was formed in 1914.

PRODUCTION OUTPUT: Newsprint 115 ADT/D. Board 225 ADT/D

EFFLUENT FLOW RATE: 5.6 MIGD

CHEMISTRY: This plant produces groundwood newsprint and board. The newsprint consists of 20% sulphite pulp and 80% groundwood. The groundwood mill uses peeled logs brought in by rail. The board mill runs on pulp and recycled waste paper. Major contaminants consist of BOD solids and some phenolic compounds.

BOD ₅	3600 kg/day
Suspended Solids	810 kg/day

COMMENTS: The plant is presently under a control order to bring its effluent into compliance with Ministry guidelines. The newsprint machine is presently not operating.

NAME: BOICE-CASCADE CANADA LTD. - Fort Frances
Division (formerly Ontario-Minnesota Pulp
and Paper)

LOCATION: Fort Frances (NW)

RECEIVING WATER: Rainy River

BACKGROUND HISTORY: 1943 - Company forms, amalgamating 5
Canadian subsidiaries

PRODUCTION OUTPUT: 283 ADT bleached kraft pulp
580 ADT groundwood specialities
138 ADT newsprint

EFFLUENT FLOW RATE: A total volume of 18-23 MGD is discharged by
the mill. Effluents contain wastes from
biologically treated (aeration lagoon) kraft
mill and paper mills, clarified woodroom
wastes, condensor and cooling waters.

CHEMISTRY: pH - 5.5 - 7.2
BOD₅ - 110-210 ppm
COD - 1000 ppm
Total solids
- 2200 ppm
Suspended Solids
- 170 - 220 ppm
Dissolved Solids - 2000 ppm
Phenols - 150-23 - ppb
Total phosphorus - 1-2 ppb
Total Kjeldahl N - 10-15 ppm
Ammonia N - 0.5-0.75 ppm

COMMENTS:

NAME: BOISE CASCADE CANADA LTD. Kenora Paper
Division (formerly Ontario-Minnesota Pulp &
Paper)

LOCATION: Kenora, Ontario (NW)

RECEIVING WATER: Winnipeg River

BACKGROUND HISTORY: 1943 - Company formed, amalgamating 5
Canadian Subsidiaries

PRODUCTION OUTPUT:

EFFLUENT FLOW RATE: A flow of 15-20 MDG is average. Effluents
carry waste from clarified paper mill and
woodroom wastes, sulphite waste liquors,
cooling and condensing waters.

CHEMISTRY: pH 5-6
BOD₅ 100-800 ppm
COD 500-1500 ppm
S.S. 100 ppm

COMMENTS:

NAME: B. F. GOODRICH CHEMICAL CANADA LTD.

LOCATION: Thorold (WC)

RECEIVING WATER: Welland River

BACKGROUND HISTORY: The plant was built in 1956 and has been in continuous operation ever since.

PRODUCTION OUTPUT: 116 tons/day of polyvinyl chloride

EFFLUENT FLOW RATE: 0.3 MIGD

CHEMISTRY: The plant produces two basic grades for polyvinyl chloride from the vinyl chloride monomer. Polymerization is carried out in batch reactors. Presently, there are no major pollution problems associated with this plant.

COMMENTS:

NAME: CANADIAN INDUSTRIES LTD. (C.I.L.)

LOCATION: Courtright (SW)

RECEIVING WATER: St. Clair River

BACKGROUND HISTORY: Construction started in March 1965 and was completed in Mid-1967. The plant was expanded in 1975 with two additional ammonia plants and a new process for sulphur coated urea.

PRODUCTION OUTPUT: 600/000 tons/year of a wide variety of fertilizers including liquid ammonia, urea, and ammonium, nitrate, mono and diammonium phosphate, phosphoric acid and nitric acid

EFFLUENT FLOW RATE:

CHEMISTRY: The anhydrous ammonia plant combines hydrogen from natural gas with steam and atmospheric nitrogen. Phosphate rock and sulphuric acid are also used. The effluent may contain ammonia phosphate.

COMMENTS: The company operated two automatic Dowex ion exchange filters that remove virtually all the ammonia from the treated flow.

NAME: CANADIAN INDUSTRIES LIMITED (C.I.L.)

LOCATION: Nobel, Ontario (Parry Sound) (NE)

RECEIVING WATER: Georgian Bay

BACKGROUND HISTORY:

- 1920 - Start up of NG explosives
- 1940 - Start up of Nitric Acid
- Jan. 2/70 - Installation of pH controller for liquid Na OH neutralization of acid spills
- Oct. 25/71 - Construction of holding pond with pH controlled automatic shut off valve at outfall
- Company submitting pH strip chart for 8 hour period every Tuesday
- Jan. 25/72 - Start of monthly effluent sampling programme. Analysis to include pH, ammonium, nitrate, sulphates, phosphates and Freon extractables.
- Sept. 13/73 - 85,000 lbs. sulphuric acid spill. Treated with Na OH for pH control
- Aug. 29/73 - OWRC sediment sampling programme of Georgian Bay vicinity of pond discharge
- Company requested to submit pH strip charts for 24 hour period every Tuesday
- Jan. 16/76 - 500 gal. sulphuric acid spill treated with Na OH for pH control
- April 1/76 - Dyke Failure at holding pond
- Oct. 25/76 - Dyke failure at holding pond, same vicinity of previous break. Plywood sluice-way installed to direct incoming water to centre of pond
- Sept. 14/76 - Bioassay Toxicity Test
- Feb. 14/77 - 7,000 lbs. nitric acid spill treated with Na OH for pH control
- April 21/77 - Dyke failure at holding pond, extensive repairs included concrete reinforcement walls
- Sept. 8/77 - C of A's issued for the manufacturing of Ethylene Glycol Mononitrate cap sensitive slurry explosives
- Dec. 6/77 - 3800 nitric acid spill treated with Na OH for pH control
- Jan. 18/78 - 9000 kilos nitric acid spill treated with Na OH for pH control

PRODUCTION OUTPUT: NG = 3×10^6 tons in 1977
Nitric Acid - 250 tons/month

EFFLUENT FLOW RATE: Unknown rate of discharge into creek leading directly to Georgian Bay

CHEMISTRY: Values quoted are based on a 6 month period in 1977.

Nitrate	=	1179 lbs/month
Ammonia	=	215 lbs/month
Sulfate	=	2179 lbs/month
pH	=	6.5

COMMENTS: Toxicity tests would indicate that volatiles and/or BOD, COD are the major contributors to the observed toxicity.

NAME: C.I.L. #2

LOCATION: Sudbury (NE)

RECEIVING WATER: Kelly Lake

BACKGROUND HISTORY: 1960 - Begins production

PRODUCTION OUTPUT: This operation produces H_2SO_4 .

EFFLUENT FLOW RATE: 300,000 gallons/day of cooling water from Kelly Lake is spilled over. These contain H_2SO_4 and are recycled to the lake

CHEMISTRY:

D. S.	-	22,000 ppm
SO_4	-	1400 ppm
Fe	-	160
Cu	-	13
Ni	-	3

COMMENTS: This is an auxillary operation to the smelting operations carried out in the area. It utilizes sulfates from the milling and smelting operations to produce H_2SO_4 . Its effluent had an LC_{50} of ~36%.

NAME: CANADIAN INTERNATIONAL PAPER COMPANY (C.I.P.)

LOCATION: Hawkesbury (SE)

RECEIVING WATER: Ottawa River

BACKGROUND HISTORY: 1963 - settling pond constructed

1975 - Control Order issued requiring chemical recovery for spent sulphite liquor to be installed by December 31, 1980. The company was also to submit a proposal to treat toxic wastes by December 31, 1981

PRODUCTION OUTPUT: Dissolving grade pulp: 270 tons/day

EFFLUENT FLOW RATE: 24×10^6 gallons/day

CHEMISTRY: Suspended solids = 3 tons/day
BOD = 160 tons/day
pH = ~ 3
highly coloured brown

COMMENTS:

NAME: Chrysler of Canada Ltd.

LOCATION: Windsor (SW)

RECEIVING WATER: Detroit River

BACKGROUND HISTORY: The plant started production about 1930. A major expansion between 1962 and 1968 altered production from 50,000 units/year to 219,000 units/year.

PRODUCTION OUTPUT: 1977 - 215,000 units. Cars and vans

EFFLUENT FLOW RATE: 2.36 MIGD

CHEMISTRY: Basic auto assembly including engine machining and assembly and auto assembly, welding, painting, bonderizing.

Major contaminants include BOD, COD, suspended solids, dissolved solids, oils and zinc

COMMENTS: The treatment system appears to be both well designed and operated.

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NAME: COURTAULDS (CANADA) LIMITED

LOCATION: Cornwall (SW)

RECEIVING WATER: St. Lawrence River

BACKGROUND HISTORY: 1977 - Control order is issued requiring reduction in zinc, BOD₅, and suspended solids plus installation of an extended diffuser outfall

PRODUCTION OUTPUT: Viscose production - 1/2 spun for Caravelle Carpets, 1/2 sent to TCF of Canada Ltd.

EFFLUENT FLOW RATE: Sulfide sewer: 1,000,000 gal/day
Viscose sewer: 500,000 gal/day
Acid sewer: 1,200,000 gal/day

CHEMISTRY: pH: 1-2 and 11-12
BOD
suspended solids: high
dissolved solids: high
zinc: high

COMMENTS:

NAME: CYANAMID OF CANADA LTD., Welland works

LOCATION: Welland (WC)

RECEIVING WATER: Welland River

BACKGROUND HISTORY: In one form or another chemical manufacturing has been carried out at this site since the early part of the century.

PRODUCTION OUTPUT:

Ammonia plant	775 tons/day
Nitric acid plant	500 tons/day
Ammonium Nitrate plant	600 tons/day
Urea Plant	365 tons/day
Dicyandiamide plant	15 tons/day
Guanidine Nitrate Plant	27 tons/day
Picrite plant	27 tons/day
CO ₂ plant	96 tons/day
H.D.S. plant	5 tons/day

EFFLUENT FLOW RATE: 36" Sewer 0.72 MIGD
Thompson's Creek 2.5 MIGD

CHEMISTRY: The basic production process in this plant is the manufacture of ammonia from natural gas, steam and atmospheric nitrogen. There are additional plant units manufacturing nitric acid, ammonium nitrate, urea, dicyandiamide, xanthates among others.

Nitrogen compounds in general and ammonia in particular are especially troublesome in both effluent flows.

COMMENTS: The effluents from this plant have not been evaluated for the presence of organic compounds that could have adverse biological effects. Presently the plant is under a control order to bring its effluents into compliance with Ministry guidelines.

NAME: DENISON MINES LIMITED - Stolley Lake

LOCATION: 11 miles north of Elliot Lake on Hwy 108 (NE)

RECEIVING WATER: Serpent River

BACKGROUND HISTORY:

1957	-	begin mining and milling uranium oxide
1967	-	MOE initiates monthly water monitoring programme
1969	-	New settling pond below tailings area excavated
1970-76	-	Annual MOE - company meetings to plan discharge control and Ra level stabilization
1977	-	Control order issued requiring Radium leaching studies and stabilization of tailings areas and reduction of N cpd output

PRODUCTION OUTPUT: The mine-milling proces produces yellow coke (ammonium diurate)
Output figures are unavailable but estimates put mining rate at 7500 tons/day

EFFLUENT FLOW RATE: The point of discharge is the Stollery Lake Outlet, at a flow of 2500 IGPM

CHEMISTRY:

pH	=	8
Radium 226	=	3 → 5 pCi/l
NH ₄	=	45 mg/L
NO ₃	=	100 mg/L
heavy metals	=	OK

COMMENTS: MOE investigations into the lethality of the stream were initiated to establish background data. Lethality was determined by 96 hr. static bioassay. The results of this test are a 96 hr LC₅₀ 56%.

NAME: DENISON MINES LIMITED - Stanrock

LOCATION: 20 miles N. E. of Elliot Lake on Quirke Lake (NE)

RECEIVING WATER: Serpent River basin

BACKGROUND HISTORY: 1958 - 1959: Conventional mining
1959 - 1971: Bacterial leaching
1973 - Denison takes over mining operation
1974 - MOE and Denison agree to install treatment plant
1976 - Treatment plant opened
1977 - Treatment commenced (Ba & lime)
- Control order issued requiring the stabilization of tailing areas. Minimize water flow, leaching and wind erosion by covering. It was hoped that the effort would encourage revegetation.

PRODUCTION OUTPUT: The property is not being mined at present

EFFLUENT FLOW RATE: The point of discharge sampled for bioassay was the "New Dam Overflow". There is no information presently available on rate of flow.

CHEMISTRY: pH = 2.5
Radium 226 = 2 pCi/l
Fe = 250 mg/L
Diss. Solids = 2500 mg/L

COMMENTS: MOE investigations into the lethality of the streams were originated to establish base data. Lethality, as determined by 96 hr. static bioassay indicated an LC₅₀ 55%, neutralization rendered the effluent non-toxic

NAME: DOMINION FOUNDRY AND STEEL CO. (Dofasco)

LOCATION: Hamilton (WC)

RECEIVING WATER: Burlington Bay

BACKGROUND HISTORY: The plant started as a foundry well before the turn of the century. In the mid-1950's the open hearth furnaces were retired and replaced with the more efficient basic oxygen furnace.

PRODUCTION OUTPUT: 3.2 million tons/year. Much of the production is in the form of sheet steel used in car bodies and major appliances.

EFFLUENT FLOW RATE:

Ottawa Street Sewer	46 MIGD
Lagoon Effluent	51.4 MIGD
Boiler House	30.0 MIGD
Coke Oven/Melt Shop	16.5 MIGD
Total	143.9 MIGD

CHEMISTRY: Basic iron and steel plant; Electrolytic tinning, pickling, galvanizing and annealing. High silicon steel is also made for transformers. Electric arc furnaces supply the foundry which makes castings for rail car under carriages.

Major contaminants include:

Ottawa Storm Sewer	- Solids, oils, iron, zinc
Lagoon Storm Sewer	- Solids, occasionally ammonia phenolics cyanides
Boiler House -	Cooling water only
Coke oven/Melt shop	- oils, phenolics, cyanide ammonia

COMMENTS: Modifications to the ammonia stripper will reduce NH_3 into a lagoon. Improved efficiency of the acid regeneration plant will remove additional iron. Improved efficiency of the cold mill treatment will lower contamination in the Ottawa St. sewer. New thickener will be used as a standby.

NAME: DOMTAR FINE PAPERS LTD.

LOCATION: Cornwall (SW)

RECEIVING WATER: St. Lawrence River

BACKGROUND HISTORY: 1972 - sulphite pulp mill shut down
1972 - dry debarking and clarifier installed
1974 - steam stripper equipment installed:
BOD₅ loadings reduced
1975 - start up of Copeland Reactor resulted
in further reduction in BOD₅ loadings
1975-76 - improvement in clarifier operation and
cutback on water usage resulted in
reduced suspended solids

PRODUCTION OUTPUT: fine papers: 650 tons/day
bleached kraft pulp: 400 tons/day

EFFLUENT FLOW RATE: 30 x 10⁶ gallons per day is discharged via
a diffuser outfall extending 300 feet into
the River

CHEMISTRY: BOD₅: 16 tons/day
Suspended solids: 15 tons/day

COMMENTS:

NAME: DOMTAR FINE PAPERS LTD.

LOCATION: St. Catherines (WC)

RECEIVING WATER: Old Welland Canal

BACKGROUND HISTORY: NA

PRODUCTION OUTPUT: 150 ADT/D 24 hours per day: 5 days/week

EFFLUENT FLOW RATE: 2.5 MIGD

CHEMISTRY: Fine paper mill, repulping, cleaing,
refining, sheet formation.
74% purchased pulp
26% waste paper
Major effluent components are solids, BOD,
COD.
BOD₅ - 440 kg/day
Suspended Solids - 150 kg/day

COMMENTS: The plant is presently under a control order
to bring its effluent into compliance with
Ministry guidelines.

NAME: DOMTAR PACKAGING/DRAFT PAPER & BOARD DIVISION

LOCATION: Red Rock (NE)

RECEIVING WATER: Nipigon Bay

BACKGROUND HISTORY: 1977 - Requirement and direction issued by MOE

PRODUCTION OUTPUT: Produces 170 tons/day groundwood and 660 tons/day Kraft pulp to manufacture 228 M tons/year linerboard and 65 M tons/year newsprint

EFFLUENT FLOW RATE: The mill effluent has been divided into 3 separate streams.

- i) Uncontaminated effluents: 7 m³/min cooling water and seal water
- ii) Primary clarification effluent: 37 m³/min high suspended solids wastewater processed by a 46 m diameter clarifier
- iii) Low Suspended Solids Stream: 14 m³/min low suspended solids waste water

CHEMISTRY: BOD₅ = 15.400 kg/day
Suspended Solids = 4,600 kg/day

COMMENTS:

NAME: DOMTAR PACKAGING

LOCATION: Trenton (SE)

RECEIVING WATER: Trent River

BACKGROUND HISTORY: 1926-27- Mill was designed and built to produce 40 tons/day using milk-of-lime method

1951 - Caustic soda replaced lime and soda ash method of pulping

1956 - New pulping facilities installed using caustic soda semichemical process. Soon after changed to neutral sulphite semichemical (NSSC) process

1969 - Diffuser pipe installed for discharge of process water

1972-74 - In plant improvement to reduce solids & BOD losses

1974 - Pulping process altered to a sulphur-free system using sodium carbonate semi chemical cook

PRODUCTION OUTPUT: 180 tons of corrugating medium daily

EFFLUENT FLOW RATE: process water effluent 47,000 I.G.P.D.
vacuum seal effluent 133,000 I.G.P.D.
cooling water effluent 368,000 I.G.P.D.

CHEMISTRY: Suspended solids 400 lbs/day
BOD₅ 3 tons/day

COMMENTS:

NAME: DOW CHEMICAL OF CANADA LTD., SARNIA DIVISION

LOCATION: Sarnia (SW)

RECEIVING WATER: St. Clair River

BACKGROUND HISTORY: 1942 styrene plant started production. Presently the plant employs 1350 people and runs 23 separate production units producing a variety of inorganic and organic chemicals. Units in chronological order of production are: ethylene and propylene glycol plant, chlorine and caustic soda plant, ammonia plant, ethylene, styrene, ethanolamine, chlorinated solven, latex, vinyl chloride, polyethylene and pelspan, expanded polystyrene plant

PRODUCTION OUTPUT: The largest, most diversified chemical complex in Canada. Products include various solvents, glycols, ammonia polymers, chlorine and caustic

EFFLUENT FLOW RATE:

42" sewer	13.2 MIGD
48" sewer	16.2 MIGD
Acid Tile Drain	2.3 MIGD
First St. Sluice	7.3 MIGD
2nd St. Sewer	12.8 MIGD
3rd St. Sewer	22.8 MIGD
D.O.E.O.	35.7 MIGD
4th St. Sewer	68.5 MIGD
Steam plant	3.0 MIGD
Total	182.2 MIGD

CHEMISTRY:

COMMENTS: The basic raw materials consist of brine from deep wells and light hydrocarbon feed stocks from neighbouring refineries. This industrial complex is a major source of inorganic compounds to the St. Clair River. It is believed to be the major source of mercury to the St. Clair River, Lake St. Clair and the Detroit River. Styrene, ethylbenzene, chlorine and various chlorinated organic compounds have been measured in various effluents.

NAME: DUPONT OF CANADA LTD.

LOCATION: Corunna (SW)

RECEIVING WATER: St. Clair River

BACKGROUND HISTORY: Production started in 1959. Currently, the plant is being expanded to 450 million lbs/year

PRODUCTION OUTPUT: 205 million lbs/year. Total production sold to other manufacturers. No retail sales.

EFFLUENT FLOW RATE: 6 MIGD

CHEMISTRY: Manufactures a complete range of polyethylene resins. Ethylene feed stock from Imperial Oil is polymerized to produce polyethylene. After the plant expansion of the feed stock will be from Petrosar. Effluent is basically cooling water. Previously some escape of polyethylene pellets. Methylene chloride and 1,2-dichloroethane have been measured in the effluent.

COMMENTS:

NAME: E. B. EDDY FOREST PRODUCTS LTD.

LOCATION: Espanola (NE)

RECEIVING WATER: Spanish River

BACKGROUND HISTORY: 1978 - Control order issued requiring effluent improvements by 1982.

PRODUCTION OUTPUT: 685 ADT pulp - bleached kraft
110 ADT kraft papers

EFFLUENT FLOW RATE: 29.9 MIGD

CHEMISTRY: BOD₅ - 24,700 kg/day
Suspended Solids - 720 kg/day

COMMENTS:

NAME: ELMIRA SEWAGE TREATMENT PLANT

LOCATION: Elmira (WC)

RECEIVING WATER: Canagagigue Creek to Grand River

BACKGROUND HISTORY: In 1965 the effluent from the Uniroyal Company and the town of Elmira were combined to provide better treatment for the companies effluent.

PRODUCTION OUTPUT:)
) 450,000 LIGPD
 EFFLUENT FLOW RATE:)

CHEMISTRY: The plant is a four chamber plug flow activated sludge sewage treatment plant. The facility now operates as a completely mixed extended aeration system. For major contaminants see the Uniroyal Co. Ltd.

COMMENTS:

NAME: ETHYL CORPORATION OF CANADA

LOCATION: Corunna (SW)

RECEIVING WATER: St. Clair River

BACKGROUND HISTORY: Production started in 1956. Started production of ethyl chloride and ethylene dichloride in 1960. Production of Antioxidants, detergents, de-icers, corrosion inhibitors, aluminium alkyl catalysts and pharmaceuticals started in 1964.

PRODUCTION OUTPUT: Organo-lead compounds, aluminum alkyl compounds, some pharmaceutical products.

EFFLUENT FLOW RATE: 11.0 MIGD

CHEMISTRY: Manufacturers tetra ethyl lead (TEL) and tetra methyl lead (TML) by reacting a lead sodium alloy with ethyl chloride (methyl chloride).
Major contaminants in the effluent include various forms of lead plus some chlorinated and brominated compounds.

COMMENTS: Service water for this plant is taken from Shell Oil.

NAME: FALCONBRIDGE

LOCATION: Fecunis Lake (NE)

RECEIVING WATER: Moose Creek which drains into Vermillion River and finally into the Spanish River

BACKGROUND HISTORY:

PRODUCTION OUTPUT:

EFFLUENT FLOW RATE: Small flow $\sim 1 \times 10^6$ g.p.d. except during precipitation

CHEMISTRY:

Fe	=	0.9 mg/L
Ni	=	14 mg/L
Cu	=	0.7 mg/L
pH	=	4.2 mg/L
SS	=	0.2 mg/L
d.s.	=	706 mg/L
Sulfates	=	402 mg/L

COMMENTS: Investigations initiated as the effluents from these operations are to be transferred to the Moose Lake Treatment Plant. Main source of contamination is surface drainage from tailings areas.

NAME: FALCONBRIDGE

LOCATION: Moose Lake (NE)

RECEIVING WATER: Moose Lake

BACKGROUND HISTORY: ~1960 treatment plant operations begin
1973 Expansion of tailings area
1976 MOE toxicity testing
1977 MOE toxicity testing

PRODUCTION OUTPUT:

EFFLUENT FLOW RATE: Effluent treatment with limestone is dumped
into Moose Lake at a rate of 2.3×10^6
g.p.d.

CHEMISTRY:

D. S.	=	99 mg/L
Sulfate	=	573 mg/L
Fe	=	0.3 mg/L
Ni	=	0.7 mg/L
Cu	=	0.02 mg/L
pH	=	5.8 mg/L

COMMENTS: Investigations initiated as Falconbridge
wastewater treatment plant discharges to
Moose Lake. Other contributing factors to
its over-all contaminant load would be
leachings from the Fecunis & Strathcona
tailings area.

NAME: FIBERGLASS OF CANADA LTD.

LOCATION: Sarnia (SW)

RECEIVING WATER: St. Clair River via the Township ditch

BACKGROUND HISTORY: Production started in 1948.

PRODUCTION OUTPUT: Mineral wool insulation, pipe insulation and air core insulation.

EFFLUENT FLOW RATE: 0.4 - 2.2 MIGD
average approximately/MIGD

CHEMISTRY: Basic glass production fiberized into filaments, and matted to form batts. Urea/formaldehyde and phenol formaldehyde resins are also used for accoustic panels.

COMMENTS:

NAME: FORD OF CANADA

LOCATION: Windsor (SW)

RECEIVING WATER: Detroit River

BACKGROUND HISTORY: Two machining plants, an iron casting foundry and an electric power utility building were all built before 1930. In the mid 1960's extensive work began on the examination of plant wastes and in-plant sources.

PRODUCTION OUTPUT: NA

EFFLUENT FLOW RATE: 44-50 MIGD

CHEMISTRY: Major contaminants include solids, oils, phenolics

COMMENTS: Effluent characteristics and waste treatment facilities have been described in Vaughn, Stewart H and R. S. McCurdy, The Industrial Wastewater Treatment Program, Ford-Windsor Complex, 19th Ontario Industrial Waste Conference, Toronto, June 1972.

NAME: FREEDLAND INDUSTRIES

LOCATION: Kingsville (SW)

RECEIVING WATER: Treated waste discharged to municipal
sanitary sewer than the Lake Erie

BACKGROUND HISTORY: Production started 1970

PRODUCTION OUTPUT: 25000 ft² of bright and semibright nickel
plating
25000 ft² of chromium plating

EFFLUENT FLOW RATE: 96000 IGPD

CHEMISTRY: Metal degreasing, electrocleaning plus Ni and
Cr plating. Effluent contains traces of Cu,
Ni, Fe

COMMENTS: Effluent quite alkaline, pH 10.7

NAME: GENSTAR CHEMICAL LIMITED

LOCATION: Maitland (SE)

RECEIVING WATER: St. Lawrence River

BACKGROUND HISTORY: 1961 - Original nitric acid plant and ammonia
nitrate plant built by Brockville
Chemicals
1966 - Second nitric acid plant and a urea
plant built
1976 - Third nitric acid plant, second
ammonia nitrate plus enlarging of
existing ammonia nitrate plant
completed

PRODUCTION OUTPUT: ammonia: 90,000 tons/annually
nitric acid: 315,000 tons/annually
Ammonium nitrate: 180,000 tons/annually
urea: 50,000 tons/annually
nitrogen solution 100,000 tons/annually

EFFLUENT FLOW RATE: 400,000-500,000 gal/day via a submerged
outfall, 1,100 feet long and 18 feet deep

CHEMISTRY: free ammonia: 3,100 lb/day
total kjeldahl nitrogen 4,100 lb/day
nitrate nitrogen 1,700 lb/day

COMMENTS:

NAME: GREAT LAKES FOREST PRODUCTS LIMITED

LOCATION: Thunder Bay (NW)

RECEIVING WATER: Kam River

BACKGROUND HISTORY:

- 1919 - Company organized
- 1919-1923 - Acquires timber limits, mill sited and negotiates for hydro-electric power
- 1923 - Groundwood mill construction
- 1924 - Operation begins
- 1927 - Begin construction of newsprint mill
- 1936 - Company re-organized
- 1946-48 - 2 paper machines modernized to increase capacity from 100,000 to 156,000 tons per annum
- 1955-58 - 2 more paper mills installed, increasing production 425,000 tons/year
- 1963 - The existing sulfite mill was converted from a calcium base cooking liquor to a magnesium base. Produces 20,000 tons of surplus unbleached sulfite pulp for sale
- 1966 - new bleached sulphate plant with a 200,000 ton per annum capacity of bleached and unbleached kraft pulp completed and commenced operation
- 1977 - MOE issues a Requirement and Direction which will be 1980 considerably improve effluents

PRODUCTION OUTPUT: The company is rated to produce 402,000 metric tons/year of chemical pulp
370,000 metric tons/year of newsprint
71,000 metric tons/year of waferboard
19,000,000 fbm/year of stud lumber

EFFLUENT FLOW RATE: All effluents are handled through different clarifiers but are combined for a final outflow.

CHEMISTRY:	BOD ₅	92,500 kilograms per day
	Suspended Solids	21,780 kilograms per day
	Dissolved Solids	405,000 Kilograms per day

COMMENTS:

NAME: HOUDAILLE PLATING

LOCATION: Oshawa (C)

RECEIVING WATER: Oshawa Creek to Lake Ontario

BACKGROUND HISTORY: Metal fabricating and finishing started in 1930

PRODUCTION OUTPUT: 91,000 ft² of semi bright Nickel plating
91,000 ft² of semi bright Nickel plating
86,000 ft² of chromium plating

EFFLUENT FLOW RATE: 72,000,000 MIGD

CHEMISTRY: Metal pickeling, surface treating plus nickel and chromium plating

COMMENTS: Two major flows from the plant were examined. Spent pickle liquor is pumped to nearby tannery to neutralize its effluents. The lethal effluent contained substantial amounts of organic material and iron.

NAME: IMPERIAL OIL ENTERPRISES LTD! (Refining)

LOCATION: Sarnia (SW)

RECEIVING WATER: St. Clair River

BACKGROUND HISTORY: Oil refining started on this site before the turn of the century. Since then the plant has expanded to its present size and complexity.

PRODUCTION OUTPUT: 134,000 barrels of crude oil per day throughout is converted to about 600 different products

EFFLUENT FLOW RATE:

#3 Seperator	15 MIGD
#5 Seperator	12 MIGD
#9 Seperator	12 MIGD
#11 Seperator	12 MIGD
Bio Oxidation Plant	15 MIGD
	66 MIGD

CHEMISTRY: Basic oil refining plus extensive hydrocarbon feed stock preparation and modification. Some phenolic compounds are found in the Bio Oxidation plant effluent. The seperators basically treat clean cooling water which can occasionally contain high concentrations of hydrocarbons.

COMMENTS: Since 1967 the company has spent more than \$25 million in air and water pollution control measures. The company is presently under a Ministerial control order from 1970-1980.

NAME: IMPERIAL OIL - Petrochemical plant (Esso Chemical Canada Limited)

LOCATION: Sarnia (SW)

RECEIVING WATER: St. Clair River

BACKGROUND HISTORY: Esso Chemicals Canada is a subsidiary of Imperial Oil Enterprises Ltd. The plant went into production in 1957. A polyvinyl chloride resin plant went into production in 1966.

PRODUCTION OUTPUT: NA

EFFLUENT FLOW RATE: 2.4 MIGD

CHEMISTRY: Naphtha specialities plant produces solvents for dry cleaning, printing ink, rubber industry. Two hydrocarbon cracking units produce ethylene, propylene, butylenes, butadiene, benzene, toluene, xylene. These compounds are used in the manufacture of styrene, paints, inks and explosives.

COMMENTS: Work will begin in mid-1978 on an activated carbon filtration system for the petrochemical plant effluent.

NAME: INCO - Copper Cliff Creek

LOCATION: Sudbury (NE)

RECEIVING WATER: Kelly Lake and Spanish River system

BACKGROUND HISTORY: 1975 - treatment plant goes into service

PRODUCTION OUTPUT: N/A

EFFLUENT FLOW RATE: Flow through the treatment plant averages at
26 x 10⁶ g.p.d. It maximum capability is
60 x 10⁶ g.p.d.

CHEMISTRY:

pH	-	9.2
SS	-	15
NH ₄	-	40 ppm
Ni	-	0.6

COMMENTS: Investigations initiates as the plant treats effluent from the iron ore plant, the Clarabell Mill, the Nickel refinery, CIL #1 plant as well as runoff from the main trailings area, smelter pond overflow and surface drainage from the smelter complex. Regional MOE staff consider the plant to be operating to specifications. All the creek water is clarified and sludge removed prior to discharges.

NAME: INCO

LOCATION: Levack (NE)

RECEIVING WATER: Moose Creek initially which enters the Spanish River

BACKGROUND HISTORY: 1900 - Milling commences
1976 - MOE bioassay for toxicity
1977 - MOE bioassay for toxicity
1978 - shut down of operations

PRODUCTION OUTPUT: N/A. Totally recycled to process, some overflow to creek

EFFLUENT FLOW RATE: $\sim 1 \times 10^6$ g.p.d. enter the creek from the tailings area with decant stretcher

CHEMISTRY:

Ni	=	0.4
pH	=	9.2
S.S.	=	25
NH ₄	=	4.3

COMMENTS: Bioassay results are 96 hr LC₅₀ < 10%.

NAME: INCO - Nolin Creek

LOCATION: Sudbury (NE)

RECEIVING WATER: Kelly Lake

BACKGROUND HISTORY: 1973 - treatment plant opens

PRODUCTION OUTPUT: N/A

EFFLUENT FLOW RATE: 2×10^6 g.p.d. of water pass through creek to Kelly Lake

CHEMISTRY:

pH	=	8.6
Ni	=	3.2
NH ₄	=	13
SS	=	30

COMMENTS: Investigations initiated to obtain a comprehensive overview of all streams passing through mining properties. Sources of contamination in this stream are mainly surface run-off. High values occur during by-pass phases of the treatment plant.

NAME: INCO METAL CO. LTD.,

LOCATION: Shebandowan (NW)

RECEIVING WATER: Gold Creek to Matawin River

BACKGROUND HISTORY: Approx. 1967 - Begins operation

PRODUCTION OUTPUT: 1700 metric tons/day of nickel/copper concentrate

EFFLUENT FLOW RATE: Tailings pond used for settling solids

CHEMISTRY:

Suspended solids	- 14.3 kg/day
Copper	- 0.014 kg/day
Nickel	- 0.24 kg/day
Lead	- <0.01 kg/day
Zinc	- 0.04 kg/day
Iron	- 0.64 kg/day

COMMENTS:

NAME: INDUSTRIAL GRAIN PRODUCTS LTD.

LOCATION: Thunder Bay (NW)

RECEIVING WATER: Kaministiquia River to L. Superior

BACKGROUND HISTORY: 1948 - Company begins operation
 1970 - DeLaval spray dryer installed; reduced BOD and solids with a 4% increase in product recovery.
 1973 - Attempts to reduce water consumption, leading to a 45% reduction in effluent
 1974-77 - Continuing attempts by company to reduce pollution load
 1978 - MOE will issue a Requirement and Directive

PRODUCTION OUTPUT: Wheat-starch and gluten plant producing 270,000 lbs. of flour per day

EFFLUENT FLOW RATE: 215,200 gallons of effluent per day

CHEMISTRY: 17,600 lbs. of solids/day
 15,700 lbs. of BOD/day

COMMENTS:

NAME: KIMBERLEY-CLARK OF CANADA LTD.

LOCATION: St. Catherines (WC)

RECEIVING WATER: Old Weland Canal

BACKGROUND HISTORY: Paper and paper products have been produced at this site since the early part of the century.

PRODUCTION OUTPUT: 100 ADT/D 24-hours per day, 7 days/week

EFFLUENT FLOW RATE: 2.4 MIGD

CHEMISTRY: Tissue mill uses processes of repulping, cleaning refining and sheet formation
1300 tons/mo - purchased pulp
1600 tons/mo - waste paper

Major contaminants include solids, BOD, COD
BOD₅ - 340 kg/day
Suspended Solids - 81 kg/day

COMMENTS: A program has been submitted for the control of BOD. The plant is presently under a control order to bring its effluent into compliance with Ministry guidelines.

NAME: KIMBERLEY-CLARK OF CANADA LTD.

LOCATION: Terrace Bay (NE)

RECEIVING WATER: Black Bird Creek to Moberly Bay (L. Superior)

BACKGROUND HISTORY: 1973-77 - \$240 expansion programme
Presently under a Program Approval requiring
that by June 1, 1978 the old mill will reduce
production to 350 tons/day

PRODUCTION OUTPUT: 435 tons/day Kraft Pulp

EFFLUENT FLOW RATE: Not available

CHEMISTRY: BOD₅ = 38,232 kg/day
Suspended Solids = 8,500 kg/day

COMMENTS: During 1978/79 a report will be prepared to
determine the water quality of the receiving
water. This report will be assessed for the
need of a secondary treatment system.

When the new mill becomes fully operational,
the total output of the new and old mill will be
approximately 1,250 tons/day. 50% of this
output should be obtained by June, 1978.

NAME: LUSTER DIVISION - National Hardware
Specialities Ltd.

LOCATION: Wallaceburg (SW)

RECEIVING WATER: Municipal sewer to Sydenham River

BACKGROUND HISTORY: Plant started production 1946

PRODUCTION OUTPUT:

Electro cleaning	-	10,000 ft ² /day
Co plating - cyanide	-	2000 ft ² /day
- acid	-	8500 ft ² /day
Nickel - bright	-	10,000 ft ² /day
- semi bright	-	4000 ft ² /day
Chromium	-	10,000 ft ² /day

EFFLUENT FLOW RATE: 38,400 IGPD

CHEMISTRY: Electro cleaning plus copper, bright and semi-bright nickel and chromium plating.
Effluent contains traces of Cu, Ni, Cr, Zn

COMMENTS:

NAME: MONSANTO CANADA LTD.

LOCATION: Sarnia (SW)

RECEIVING WATER: Cooling water goes to the township ditch and the St. Clair River. Contaminated process waste goes to the City of Sarnia Sewage Treatment Plant and then to the river.

BACKGROUND HISTORY: Initially the plant was built and run as part of the Polymer Corporation complex. It was subsequently shutdown, and sold to Monsanto in 1973, who reopened the plant and are presently running it.

PRODUCTION OUTPUT: Approximately 30,000,000 lbs/year

EFFLUENT FLOW RATE: 216,000 IGPD to sanitary sewer

CHEMISTRY: Manufacturers Lustran A.B.S. resin, (acrylonitrile, butadiene, styrene)

COMMENTS:

NAME: NORANDA MINES LTD., Geco Division

LOCATION: Manitouwadge (NW)

RECEIVING WATER: Big Mose Lake to Black R. System

BACKGROUND HISTORY: 1957 - Mine begins production at 3,300 tons/day
1975 - Waste Water Treatment Plant installed
1976 - Waste Water Treatment plant goes into operation

PRODUCTION OUTPUT: Present production is 5,000 tons of ore/day. Copper, lead and zinc concentrates are produced.

EFFLUENT FLOW RATE: Mine water and mill waste are pumped to a 500 acre tailings pond. Water is decanted from the tailings pond to provide 95% of water requirements of mill and 50% of the water requirements. All seepages from the tailings pond are channelled to a W.W.T.P. which has facilities for lime neutralization, aeration to oxidize ferrous iron to ferric iron, polymer addition to promote flocculation and clarification by means of an Eimco 75 foot diameter reactor clarifier.

No average flow rates are available as they are dependent on specific weather conditions.

CHEMISTRY: Decant run-off water
pH = 3-5 Cu = 1 ppm
Suspended Solids = 9.6 ppm Zn = 5.4 ppm
Dissolved Solids = 2,300 ppm Fe = 3.9 ppm

Waste Water Treatment Plant discharge:
pH = 7.2 Cu = 0.08 ppm
Suspended Solids = 6.3 ppm Zn = 1.2 ppm
Dissolved Solids = 3,300 ppm Fe = 1.1 ppm

COMMENTS:

NAME: ONR derailment

LOCATION: North Bay (NE)

RECEIVING WATER: Trouth Lake via Mitchell Creek

BACKGROUND HISTORY: August 1970 - derailment occurred, 11 cars of zinc concentrate, 4 cars of lead concentrate, 10 cars pyrite.

September 1970 - cleanup completed and recovery unknown

October 1974- complaint received, blue-grey discolouration of creek bed and apparent absence of aquatic life

1974 - 75 - Technical Support Section undertook water quality assessment of Mitchell Creek in addition to in-situ toxicity testing; found high metal concentrations and elimination of biological communities.

September 1976 - toxicity test performed by J. Reinke using Mitchell Creek water; at 96 hrs. sample appeared to exhibit bimodal toxicity, 60% mortality at 10% and 50% at 10%.

October 1976- meeting with ONR to discuss further cleanup requirements

August 1977 - ONR commenced further cleanup at derailment site; to be completed in spring of 1978.

PRODUCTION OUTPUT: N/A

EFFLUENT FLOW RATE: N/A

CHEMISTRY:

Parameter	Upstream Control	Downstream at Hwy 63
Dissolved Solids	33	86
Conductivity (umhos)	51	132
pH	7.1	6.9
Hardness	18	54
Alkalinity	11	11
Acidity	2.5	14
Sulphates	13	42
Zinc	0.01	8.1
Copper	0.01	0.04
Lead	0.01	0.01
Iron	0.16	0.20

All analyses with the exception of pH and conductivity are reported in part per million.

COMMENTS:

Investigations initiated as a result of complaints with respect to bed discoloration and decreasing fish populations.

NAME: ONTARIO PAPER CO. LTD.

LOCATION: Thorold (WC)

RECEIVING WATER: Schriener's Creek to Old Welland Canal

BACKGROUND HISTORY: The company was incorporated in 1912 with construction of the Thorold Mill completed by 1913.

PRODUCTION OUTPUT: 280 ADT/D Sulphite pulp
657 ADT/D Total production
900,000 Imp. gallon/year - Alcohol
5,600,000 lbs/year vaillin

EFFLUENT FLOW RATE: 30 MIGD

CHEMISTRY: An integrated newsprint mill using a sodium based sulphite pulping process and a groundwood mill. The plant also produces ethanol, vanillin and salt cake (sodium sulphate) which is sold to various kraft pulp mills for liquor make-up. Bleaching is done with boral (NaCO_2) and Sodium hydrosulphite ($\text{NA}_2 \text{S}_2 \text{O}_4$). Wood furnish is mainly pine and balsam.

Major contaminants in the effluent include
Solids, TOC, COD colour and foam production
BOD₅ - 20,250 kg/day
Suspended Solids - 9,000 kg/day

COMMENTS: The company is presently under a control order to bring its effluent into compliance with Ministry guidelines.

NAME: PETROSAR CO. LTD.

LOCATION: Moore Township (SW)

RECEIVING WATER: St. Clair R.

BACKGROUND HISTORY: The company was formed in 1974 as part of the Canada Development Corporation. Production started in late 1977.

PRODUCTION OUTPUT:

Polymer grade ethylene	1 billion lbs/yr
chemical grade propylene	700 million lbs/yr
butadiene-isobutylene	
butylene mixture	500 million lbs/yr
benzene	350 million lbs/yr
toluene, xylene	280 million lbs/yr
gasoline	8000 barrels/day
#2 fuel	31,000 barrels/day
residual fuel	70,000 barrels/day
synthetic natural gas	33 million ft ³ /day
L.P.G.	3500 barrels/day
crude feed rate	170,000 barrels/day

EFFLUENT FLOW RATE: 5 MIGD

CHEMISTRY: Petrosar includes a crude oil processing unit, an olefin processing unit, a gasoline treating unit and an aromatics unit.

COMMENTS: Advanced technology plus extensive use of air cooling and cooling towers results in a small effluent from this very large plant.

NAME: POLYSAR CORPORATION LTD.

LOCATION: Sarnia (SW)

RECEIVING WATER: St. Clair R.

BACKGROUND HISTORY: The Polymer Corporation was created in 1942 as a consortium of major chemical and petroleum companies. In 1972 Polysar was acquired by the Canada Development Corporation.

PRODUCTION OUTPUT:

Stereoscopic polymers	50,500,000 lbs/yr
Styrene	200,000,000 lbs/yr
co-polymers	250,000,000 lbs/yr
Butyl rubber	97,000,000 lbs/yr
Latex rubber	90,000,000 lbs/yr

EFFLUENT FLOW RATE:

Township ditch	54.0 MIGD
54" Sewer	10.2
Stereo A.P.I.	0.8
66" Sewer	50.0
72" Sewer	3.5
	<u>119.5</u>

CHEMISTRY: The plant manufactures a variety of synthetic rubbers using styrene, isoprene, butadiene etc. Major contaminants in the effluent include phenolics, chlorinated compounds, aliphatics, benzene, isoprene, tertiary butyl alcohol.

COMMENTS: In 1977 a control order was applied against the company. Work is progressing well and appears to be on schedule.

NAME: REED LTD. - Dryden Mill Division

LOCATION: Dryden, Ontario (NW)

RECEIVING WATER: Wabigoon River

BACKGROUND HISTORY: 1910 - Town of Dryden incorporated and dam built
 1913 - Pulp mill in production
 1937, 1954, 1959, 1960, 1966 Eight official complaints from tourists and other organizations, of pollution and nuisance, to O.W.R.C.
 1951 - Lands and forests survey finds no fish within 40 miles downstream from Dryden
 1958 - Market rejection of fish from Clay Lake - tainting
 1962 - Chlor-alkali plant in operation
 1968 - Water quality survey by OWRC
 - Dryden Water Quality Pollution control plant in operation
 1969 - Water pollution survey of Wabigoon R. by OWRC
 1970 - Major surveys for mercury in fish by MOE, MNR, FWI.
 - Control orders issued by MOE to Dryden Paper Co. to control pollution
 1971-75 - Company complies by installing treatment systems
 1971-75 - Major surveys of mercury in fish by MOE, MNR
 1971-72 - Survey of mercury in sediments by FWI.
 1975 - Company changes process for chlor/alkali production to permionic membrane system and dismantles mercury cells.
 All mercury discharges cease

PRODUCTION OUTPUT: 1974 figures showed the mill produced 210,000 tons of bleached and unbleached pulp, and 64,000 tons of paper and board

EFFLUENT FLOW RATE: Effluent is discharged to the river at a rate of 27 MGD, containing treated woodroom wastes (chlor-alkali plant waste (while in production), kraft mill wastes and paper mill wastes.

CHEMISTRY: pH = 5.8 ppm Total Phosphorus = 0.37 ppm
 BOD₅ = 270 ppm Sol. Phosphorus = 0.06 ppm
 COD₅ = 1125 ppm Ammonia N = 0.44 ppm
 Total Solids = 1073 ppm Total Kjeldahl N = 2.2 ppm
 Suspended Solids = 140 ppm Nitrate N = 0.03 ppm
 Dissolved Solids = 933 ppm Nitrite N = 0.07 ppm
 Sodium = 170 ppm An = 0.03 ppm

COMMENTS: The main form of contaminant released from this mill was mercury. It has ceased discharging Hg since conversion of its plant in 1975. MOE is still actively monitoring the mill and receiving water.

NAME: REICHHOLD CHEMICALS LTD.

LOCATION: Thunder Bay (NW)

RECEIVING WATER: Kaministiquia River to Lake Superior

BACKGROUND HISTORY: 1976 - Begins operation

PRODUCTION OUTPUT: Company produces urea formaldehyde resin used in the manufacture of particle boards.

EFFLUENT FLOW RATE: Operates an activated sludge plant to treat the formaldehyde.

CHEMISTRY:

BOD ₅	-	3.1 kg/day
Suspended Solids	-	14.4 kg/day
Dissolved Solids	-	119 kg/day

COMMENTS:

NAME: RIO ALGOM LIMITED - Milliken - Stanleigh Properties

LOCATION: 1 mile east of Elliot Lake (NE)

RECEIVING WATER: Serpent River System, Crotch Lake - McCabe L.

BACKGROUND HISTORY: 1958 - begin conventional operation
1960-64 - bacterial leaching operation
1964 - operations cease
1967 - MOE monitoring programme initiated
1973 - treatment of tailings area initiated
1977 - control order requiring tailings stabilization

PRODUCTION OUTPUT: N/A

EFFLUENT FLOW RATE: The point of discharge sampled for bioassay was designated CL-4, Crotch Lake outlet. There is no information presently available on rate of flow.

CHEMISTRY: pH = 7
TDS = 250 mg/L
Radium = 8 pCi/l
low metals
D.S. ~60% of TDS as SO₄
Alk. ~14

COMMENTS: Water quality acceptable at sampling location, however, at tailings site (other 1/2 of lake) the situation is poor

NAME: RIO ALGOM LIMITED - Nordic (Lacnor) Property

LOCATION: 2 miles south of Elliott Lake on Hwy 108 (NE)

RECEIVING WATER: Serpent River Basin

BACKGROUND HISTORY: 1957-68 - Conventional mining activity
1968 - Conventional mining ceased
- Leaching programme
1969 - Drying operation for Quirke slurry initiated
1971 - Treatment of tailings area initiated
1977 - Control order issued, requiring stabilization of tailings area, and improvement to dams

PRODUCTION OUTPUT: N/A
This operation is approximately 10% active. It's function is to dry the yellow slurry of Quirke property to saleable yellow cake.

EFFLUENT FLOW RATE: The point of effluent discharge from company property was designated as N-19 (North Nordic Lake effluent). Toxicity samples were taken from station N-12 (Buckles Creek at Hwy. 108). The estimated rate of discharge from the property is 750 IGPM. Creek flow at station N-12 is 1500 IGPM.

CHEMISTRY:

N-19 station		N-12 station	
pH	= 7.5	pH	= 6.5
TDS	= 1300 mg/L	TDS	= 800 mg/L
NO ₃	= 6 mg/L	RA	= 5 pCi/l
NH ₃	= 8 mg/L		
Ra	= 3 pCi/l		

COMMENTS: Downstream levels of Ra higher than just after treatment, as leaching occurs from the various other operation areas the stream passes through. By-passing operations have been successful to date.

NAME: RIO ALGOM LIMITED - Pronto Property

LOCATION: 5 miles west of intersection of Hwy 108 & Hwy 17 (NE)

RECEIVING WATER: Pronto Creek and northshore of Lake Huron

BACKGROUND HISTORY: 1955-1960 - mining and milling of uranium
1960-70 - milling of copper
1970 - production stopped
1970-77 - MOE monitoring programme
1977 - Stabilization programme, improve treatment facility

PRODUCTION OUTPUT: N/A

EFFLUENT FLOW RATE: The point of effluent discharge from company property was designated as PR-4 (outlet of settling pond below treatment plant). Toxicity samples were taken at Station PR-1 (treated effluent at Hwy 17, downstream of PR-4).

CHEMISTRY: Fe = 0.1-3 mg/L
Other Metals = Ok
Suphate = 300-600 mg/L
Rodium = 3-5 pCi/l

COMMENTS:

NAME: RIO ALGOM LIMITED - Panel Property (Strike Lake)

LOCATION: North shore of Quirke Lake (NE)

RECEIVING WATER: Serpent River basin via Rochester Creek

BACKGROUND HISTORY: 1958 - operations begin
1961 - operations cease
1974 - tailings area stabilization begins
1976 - presently being prepared for re-activation

PRODUCTION OUTPUT: N/A

EFFLUENT FLOW RATE: Two samples for bioassay were obtained for this property. One sample was taken from No. 3 Beaver Pond outlet, a second sample was obtained at station P-2, the Strike Lake outlet. There is no available data on flow rates at either of these sites.

CHEMISTRY:

No. 3 Beaver Pond Outlet	Strike Lake Outlet (P-2)
pH = 3	ph 4.5
TDS = 1500 mg/L	TDS 400 mg/L
Ra = 15 pCi/l	Fe 3 mg/L
	Ra 8 pCi/L

COMMENTS: The reactivation entails pumping of water from mine. This water is being processed for radium recovery.

5-66

NAME: RIO ALGOM LIMITED - Quirke Property

LOCATION: 12 miles north of Elliot Lake on Hwy. 108 (NE)

RECEIVING WATER: Serpent River

BACKGROUND HISTORY: 1956-61 - in operation
1961-67 - closed down
1967 - operations resume. MOE
monitoring programmes initiated.
1977 - control order issued requiring
additional neutralization at
the mill, also near final
discharge

PRODUCTION OUTPUT: This operation produces yellow cake (ammonium
diurate). Output figures are unavailable

EFFLUENT FLOW RATE: The point of discharge sampled for bioassays
was designated as Q3 - Quirke, tailings after
treatment. The rate of flow is 3800 IGPM

CHEMISTRY: pH = 7.5
T.D.S. = 2500 mg/L
SO₄ = 1300 mg/L
NO₃ = 75 mg/L

COMMENTS:

NAME: P. L. ROBERTSON MFG. CO.

LOCATION: Milton (C)

RECEIVING WATER: Sixteen Mile Creek

BACKGROUND HISTORY: Production started in 1908. At full production the plant employs 450 people

PRODUCTION OUTPUT: Maximum of 13,000 tons of steel per year.
200 tons of brass and steel per year.

EFFLUENT FLOW RATE: 17,600 I.G.P.D.

CHEMISTRY: Metal cleaning and treating plus Cu, Ni, Cr, Zn, Cd and brass plating. Effluent contains traces of Ni, Cu, Zn, Cr and Fe.

COMMENTS:

NAME: SHELL CANADA LTD.

LOCATION: Moore Township (SW)

RECEIVING WATER: St. Clair River

BACKGROUND HISTORY: The refinery went into operation in 1952. Since then production has expanded and a petrochemical plant has been added.

PRODUCTION OUTPUT: 86,000 barrels of crude through-put per day

EFFLUENT FLOW RATE: 49 MIGD

CHEMISTRY: Basic oil refinery plus a petrochemical plant. Products include propane, butane, butylenes, liquid sulphur, benzene, toluene, xylene. Methylene chloride has been detected in the refinery waste water

COMMENTS: Over the past several years \$6 million has been spent on air and water pollution control measures

5-69

NAME: SHELL CANADA LTD.

LOCATION: Oakville, Ontario (C)

RECEIVING WATER: Lake Ontario

BACKGROUND HISTORY: Production started in late 1963

PRODUCTION OUTPUT: 55000 barrels/day throughput

EFFLUENT FLOW RATE: 600 gpm

CHEMISTRY: Basic oil refinery producing a full range of petrochemical products

COMMENTS: Effluent treatment consists of A.P.I. separators, a dissolved air floatation tank, activated sludge biotreaters and two equalizing ponds

NAME: SHERMAN MINE

LOCATION: Temagami (North Bay) (NE)

RECEIVING WATER: Tetapaga River

BACKGROUND HISTORY:

1967 - O.W.R.C. approvals #67-C-7 covering treatment and impounding of mill slurry issued also E.P.A. C of A #1166.275 issued for air emission control

1968 (June - Monthly water sampling programme commenced at Tetapaga weir, 72" culvert, Vermillion main dam, and Iron Creek for pH, turbidity, color (APHA), hardness, SS, DS, TS and iron.

1969 (Oct) - Exhaust stock dust samples analyzed for iron, silicates, sulphur and particulate sizing.

1970 (Oct) - Compliance inspection made for issued E.P.A. certificate of approval
- phytoplankton survey by O.W.R.C. indicated small populations

1971 - Alum and super floc added at Vermillion decant
- Link Lake filter dam completed
- South pit operation has ceased and pit being flooded.

1972 - Permit to transfer water from Tetapaga to Turtle Lake was applied for by Wm. Milne & Son, Temagami
- Green discolouration noted in Vermillion Basin.
- Unsubstantiated complaint received regarding particulate fallout on Lake Temagami - N.E. arm

1972 Sept - Meeting with Company, Air Management and Phytotoxicology personnel regarding - off-property SO₂ and particulate emissions from kiln and blasting operations. Company to establish on-property stations to monitor sulphation and particulate contamination.

1973 - MOE biological survey of receiving water
- company to prepare and submit 5 year mining programme
- company implemented on-property stations

1974 Jan.- MOE sampling snow at 6 locations on a monthly basis: locations:
2 - mine property
2 - Sherman mine road
1 - Temagami, N.E. arm
1 - Temagami, access road

- Company submits 10 year mining schedule
 - Company re-evaluating tailings basin holding capacity, is to submit expansion plans when completed
- July - MOE, phytotoxicologist, soil and vegetation survey
- Oct. - (1) C of A issued for A.A.F. electrostatic precipitation for control of welding fumes
(2) Investigations disclosed leaching of sulphates from road bed constructed partially of sulphide rich waste rock
- 1975 - Complaint re black particulate impingement on snow N.E. arm Lake Temagami
- Several other complaints re black particulates and black oil water at mouth of Tetapaga R.
- MOE air survey
- C of A #4-074-75-006 issued to company for the dewatering of the south pit
- 1976 - MOE survey of Tetapaga R.
- MOE bioassay shows Tetapaga to be non lethal
- Dam raised by Company
- Company requested to investigate and submit corrective action to eliminate the contamination of the Tetapaga R.
- 1977 - Company appoints full time Environmental Control Engineer
- Bioassay test by MOE

PRODUCTION OUTPUT: This operation produces 3260 long tons/week of Iron ore pellets

EFFLUENT FLOW RATE: 2 thirty inch culverts discharge a total of 120,000 gpd to the Tetapaga River

CHEMISTRY:

Water		Air	
		% by wt. of extractables	
Cu = < .01	pH = 6.5	Fe ₃ O ₄	93.9%
Ni = 0.1	hardness = 240 ppm	SiO ₂	5.2%
Zn = 0.5	S.S. = 9 ppm	Al ₂ O ₃	0.36%
Co = < 0.1	D.S. = 220 ppm	Phosphours	0.019%
As = < 0.01	Iron = 0.20 ppm	Sulfur	0.017%
	Turbidity = 1.7 (FTU)	CaO	0.18%
	Conductivity = 250	MgO	0.28%
	Sulfates = 105 ppm		

COMMENTS: This mine is an active contributor to pollution in the area and should be monitored continuously. A more definitive toxicity survey should be conducted.

NAME: SPRUCE FALLS POWER & PAPER

LOCATION: Kapuskasing (NE)

RECEIVING WATER: Kapuskasing River

BACKGROUND HISTORY:

- 1920 - Pulp mill constructed
 - power dam
 - calcium based sulfite mill
 - production 115TPD
- 1928 - New company formed and expansion of existing operation begun
 - 55,000 KW power dam at Smoky Falls
 - production increased to 650 TPD
- 1929 - Expansion completed
- 1932-35 - Production cut-back
- 1941 - Sulfite drier constructed
- 1959 - Bleaching added
- 1964 - Magnefite mill constructed
- 1966 - Woodchip producing plant
- 1971 - #5 paper machine installed
- 1970-71 - Primary treatment facilities constructed
- 1973 - Stud mill construction
- 1976 - Construction of TMP plant

PRODUCTION OUTPUT: 910 ADT newprint
69 ADT market sulfite

EFFLUENT FLOW RATE: Total effluent discharge to the Kapuskasing River of 40×10^6 gal/day.

CHEMISTRY: See page 73

COMMENTS: A comprehensive study on the TMP process was conducted by MOE during the summer of 1977. This report will be made available under separate cover.

CHEMISTRY:

	Chip Washer	4th Stage Cleaner	TMP stock (bleach)	TMP stock (no bleach)
BOD ₅	1533 mg/L (8 lbs/ton)	995 mg/L (2.8 lb/ton)	592 mg/L (32.9 lb/ton)	540 mg/L (30.1 lb/ton)
D.S.	2390 mg/L (12.5 lb/ton)	1634 mg/L (4.6 lb/ton)	1035 mg/L (57.5 lb/ton)	945 mg/L (52.6 lb/ton)
S.S.	1163 mg/L (6.1 lb/ton)	9373 mg/L (26.6 lb/ton)	-	-
pH			4.7	4.9
Abietic	82.9 mg/L (75%)	35 mg/L (75%)		
Dehydrabietic	11.9 mg/L (11%)	2.1 mg/L (5%)		
Levopimaric	8.5 mg/L (8%)	6.8 mg/L (15%)		
Isopimaric	4%)			
Sardaraccopimaric	1%) 100 lbs/day			
Pimaric	1%)			

NAME: STEEL COMPANY OF CANADA LTD. (Stelco)

LOCATION: Hamilton (WC)

RECEIVING WATER: Burlington Bay

BACKGROUND HISTORY: The company was formed in the 1920's from several smaller ones. Initially there was only 1 blast furnace and subsequently 3 more were added. The initial furnace is now out of operation. There are 5 coke ovens, 3 of which are from the original installation. In 1972 #3 open hearth furnace was converted to an oxygen lancing steel furnace. 1971-72 saw the construction of a basic oxygen furnace for steel production.

PRODUCTION OUTPUT: 6 million ingot tons/year of raw steel; mainly rod, plate and structural forms

EFFLUENT FLOW RATE:

West Side open cut	48 MIGD
North trunk Sewer	60
#3 open hearth cooling water	52.1
East Side Open cut	96.2
North Outfall	16.1
	<u>222.4</u> MIGD

CHEMISTRY: Basic iron and steel plant plus 3 electrolytic tinning lines, 3 pickeling lines, 3 galvanizing lines

Major contaminants:

West side open cut -	NH ₃ HCN Zn phenolics
North Trunk Sewer -	NH ₃ HCN ZN phenolics
#3 Open Hearth -	cooling water
East side open cut -	oils, iron, solids, phophorus
North Outfall -	phenols, oils

COMMENTS: East side filtration plant - stage two - will result in a reduction in the amount of oil discharged. Will be installing indirect cooling in the byproducts recovery area to control bypass discharges of HCN & NH₃.

NAME: SUN OIL CO. LTD

LOCATION: Sarnia (Corunna) (SW)

BACKGROUND HISTORY: Plant designed and built in 1952. Production started in 1953 on 15,000 barrels/day. In 1967-1969 production increased to 39,000 barrels/day. In 1976 a \$27 million petrochemical plant was added.

PRODUCTION OUTPUT: 90,000 barrels/day of crude through-put. Various petroleum fuels (gasoline diesel oil etc) plus sulphur and assorted petrochemicals

EFFLUENT FLOW RATE: 15 MIGD

CHEMISTRY: The Refinery produces heavy fuel oil, light fuel oil, kerosene, diesel oil, gasoline, aviatio fuel and LPG.

The refinery waste can contain carbon tetrachloride, methylene chloride, chloroform

COMMENTS:

NAME: TRANSPORT CELLULOSE FIBER OF CANADA LIMITED
(T.C.F.)

LOCATION: Cornwall (SE)

RECEIVING WATER: St. Lawrence River

BACKGROUND HISTORY: 1977 - Control order issued requiring
reduction in BOD₅ and suspended
solids loadings as well as the
installation of an extended diffuser
outfall

PRODUCTION OUTPUT: transparent cellulose film

EFFLUENT FLOW RATE: All effluents are discharged through the same
sewers of Courtaulds of Canada

CHEMISTRY: pH: 1-2
BOD₅: high
Suspended solids: high

COMMENTS:

NAME: TRICIL INDUSTRIAL WASTE DIPOSAL COMPANY

LOCATION: Corunna (Sarnia) (SW)

RECEIVING WATER: Surface water drainage to St. Clair River

BACKGROUND HISTORY: The facilities were originally established by Goodfellow Disposal Services. Subsequently Goodfellow was acquired by Tricil, a joint venture of Trimack Trucking Lines and Canadian Industries Ltd.

PRODUCTION OUTPUT: Nil

EFFLUENT FLOW RATE: Variable

CHEMISTRY: The company handles all types of industrial waste disposal. Disposal techniques include incineration pit disposal and deep well disposal. The surface runoff from the disposal site is heavily contaminated with a wide variety of both chlorinated and petrochemical compounds.

COMMENTS:

NAME: UNIROYAL CHEMICAL, Division Uniroyal Ltd.

LOCATION: Elmira (WC)

RECEIVING WATER: Canagagigue Creek to Grand River

BACKGROUND HISTORY: The plant started in 1941 as a chemical production plant. Subsequently, production was diversified into rubber, rubber treating, agricultural and miscellaneous chemical products.

PRODUCTION OUTPUT: Many of the processes in this plant are run on a batch basis dependent upon market demand.

EFFLUENT FLOW RATE: 50,000 IGPd

CHEMISTRY: There are approximately 30 different chemical processes run in the Uniroyal buildings. The combined effluent from Elmira/Uniroyal may contain diethyl ether, chloroform, benzene, tetrachloroethylene, bromodichloromethane, dichlorobenzene, dimethylnitrosamine (approx. 0.2 ppm). Dimethylnitrosamine is a potent carcinogen.

COMMENTS: The effluent as discharged to the receiving water is a mixture of 400,000 IGPd sanitary sewage from the town of Elmira and 50,000 IGPd from Uniroyal.

NAME: WINDSOR BUMPER CO., Division of Gulf & Western (Canada) Ltd.

LOCATION: Windsor (SW)

RECEIVING WATER:

BACKGROUND HISTORY: Metal finishing operations started in 1955. A metal fabricating section was added in 1967. Presently 250 people are employed.

PRODUCTION OUTPUT: 40,000 ft² per day of electro cleaning and etching. Also 30,000 ft²/day of bright and semibright nickel plating and 30,000 ft²/day of chromium plating.

EFFLUENT FLOW RATE: 480,000 IGPD

CHEMISTRY: Total concentration of heavy metal (Ni, Cr, Fe, Cu, Zn) approximately 1 ppm

COMMENTS: Effluent marginally lethal. pH adjustment of effluent closer to neutrality may reduce the lethality of the effluent

NAME: WINDSOR CHROME PLATING

LOCATION: Windsor (SW)

RECEIVING WATER: Storm Sewer to Detroit River

BACKGROUND HISTORY: Production started in 1962

PRODUCTION OUTPUT: 15,000 lbs/day - electrocleaning, nickel plating, chromium plating

EFFLUENT FLOW RATE: 96,000 IGPD

CHEMISTRY: cleaning, degreasing, polishing of nichel and chromium plated auto parts. Traces of Cu, Ni, Cr in effluent.

COMMENTS: Effluent non lethal @ 100% in 96 hours

SECTION 6

BIOASSAY DATA SUMMARY SHEETS

The following tables list each Industry and each of their discharges which have been tested by a bioassay. The following information will help the reader understand the tables better:

All tests are assumed to be 96 hour static, aerated bioassays at 15°C, and using rainbow trout (Salmo gairdneri Richardson), unless otherwise stated in the comments section.

- N.L. means non-lethal at 100%, unless otherwise stated
- pH and conductivity are the parameters for the 100% sample at 15°C.
- sample date is the date the sample was collected, not the date it was tested.
- inplant sample indicates a sample taken from a discharge that combines with others before the final industry's discharge.
- LC50 range is the lethal range - the range where no nortality to total nortality was observed, with no partial mortalities.
- the LC50 is the lethal concentration of effluent required to kill 50% of the fish population over a specific period of time (e.g. 96 hours or 4 days).
- the comments section identifies whether any chemical adjustments have been made to the effluent before testing and the availability of other information which migh add to the interpretation of the test.

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
ABITIBI PAPER COMPANY LTD. - Fort William (NW)	Mill Effluent Intake Service Water)	08/07/79	grab	S-197	77.5%	6.1	295	
		08/07/79	grab	S-129	N.L.	6.9	141	
	Woodroom	08/07/79	grab	S-128	8.3%	4.7	330	
- Iroquois Falls (NE)	Blowpit Discharge	08/03/76	grab	M1-S-31	<10%	4.7	2350	- 10% killed all fish in 12 hours
		08/03/76		M1-S-30	<10%	4.7	2350	- unaerated 10% killed all fish in 12 hours
	Clarifier Discharger	08/03/76	grab	M1-S-29	42%	6.8	240	- LC50 range 32-56%
		08/03/76	grab	M1-S-28	42%	6.8	240	- unaerated LC50 range 32-56%
- S.S.Marie (NE)	Main Sewer Effluent	09/13/76	grab	M1-S-52	18%	5.1	325	- unaerated
		09/13/76	grab	M1-S-53	24.0%	5.1	325	- LC50 range 18-32%
		07/11/77	grab	M1-S-41	26%	6.5	230	- unaerated
		07/11/77	grab	M1-S-42	< 100%	6.5	230	- 100% killed all fish in 72 hours

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
ABITIBI PAPER COMPANY LTD. - Smooth Rock Falls (NE)	Foam Lagoon at plant	07/06/76	grab	M1-S-18	20%			- unaerated
		07/06/76	grab	M1-S-19	37%			
		07/20/76	grab	MS-S-22	<10%	7.5	280	- unaerated - 10% killed all fish in 33 hours
		07/20/76	grab	M1-S-23	11%	7.5	280	
	Back Ravine Effluent	07/27/76	grab	M1-S-24	21%			- unaerated
		07/27/76	grab	M1-S-25	70%			
ABITIBI FOREST PRODUCTS LTD. - Sturgeon Falls (NE)	Intake (Service Water)	11/26/79	grab	S-208	N.L.	6.8	50	
	Heavy Solids	11/26/79	grab	S-212	3.5%	6.1	950	
	Floatation	08/15/77	grab	M1-S-101	50%	6.1	390	- LC50 range 30-65%
	Clarifier Dis.	11/26/79	grab	S-211	45%	6.0	275	
	Uncontaminated Sewer	08/15/77	grab	M1-S-103	N.L.	6.7	95	
		11/26/79	grab	S-109	N.L.	7.0	65	
	Spent Sulfite liquor to river	08/15/79	grab	M1-S-102	<3%	5.5	8400	
		11/26/79	grab	S-210	5.4%	7.9	8000	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
ABITIBI FOREST PRODUCTS LTD. - Thunder Bay (NW)	Pulp Mill Effluent	07/25/77	grab	M1-S-77	14%	4.8	525	- LC50 range 10-20%
	Woodroom Effluent	08/02/77	grab	M1-S-82	14%	4.9	280	- LC50 range 10-20%
ABITIBI PROVINCIAL PAPER - Thunder Bay (NW)	Total Mill Effluent	08/02/77	grab	M1-3-81	<10%	4.6	1150	- 10% killed all fish in 48 hours
		08/07/79	grab	S-125	> 100%	5.6	180	- 10% mortality in 100%
	Fine Paper Mill Effluent	07/25/77	grab	M1-S-78	14%	4.0	440	- LC50 range 10-20%
	Intake (Service Water)	08/07/79	grab	S-126	N.L.	7.4	265	
- Thorold (WC)	Clarifier decant	02/28/77	grab	S-30	39%	7.8	620	- LC50 range 30-50%
		02/28/77	grab	S-33	<50%	7.8	620	- dechlorinated - 50% killed all fish in 96 hours

DATA SUMMARY SHEET

6 - 4

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
AGNEW LAKE MINE - Elliot Lake (NE)	Tailings Slurry	08/22/79	grab	S-153	N.L.	8.3	2930	- unaerated
	Tailings Pond	06/10/77	grab	M1-S-24	N.L.	7.0	285	- unaerated
		06/10/77	grab	M1-S-25	N.L.	7.0	285	
		08/22/79	grab	S-140	47%	8.7	2550	- LC50 range 30-73% - unaerated
		08/22/79	grab	S-166	N.L.*	8.7	2550	- unaerated-diluted with Ministic creek water * at 30%
	Drainage Ditch (John's Creek)	09/20/76	grab	M1-S-62	N.L.	7.1	118	- unaerated
		06/03/77	grab	M1-S-12	N.L.	7.0	112	- unaerated
		06/10/77	grab	M1-S-22	N.L.	6.6	210	- unaerated
		06/10/77	grab	M1-S-23	N.L.	6.6	210	- unaerated
		08/22/79	grab	S-151	N.L.	7.0	210	- unaerated
	Ministic R. upstream from mine	09/20/76	grab	M1-S-61	N.L.	7.0	56	- unaerated
		08/22/79	grab	S-149	N.L.	7.0	53	- unaerated
	Ministic Creek downstream of mine	06/03/77	grab	M1-S-11	N.L.	7.2	61	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
ALCHEM - Burlington (WC)	Stormwater Drainage Sump	06/07/77	grab	S-110	N.L.	8.1	1400	- unaerated
AGNICO EAGLE - Glen Lake (NE)	Glen Lake Discharge	07/20/77 07/20/77	grab grab	M1-S-71 M1-S-72	N.L. N.L.	7.8 7.8	300 300	- unaerated - unaerated
ALEXANDRIA MUNICIPAL DISCHARGE - Alexandria (SE)	Manholes of Outfalls of Lagoons 1,2,3	08/10/77	3 grabs	M2-S-109	N.L.	7.5	700	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
ALGOMA STEEL - S.S. Marie (NE)	Terminal Basin	09/07/76	grab	M1-S-42	<10%	8.5	340	- unaerated-10% killed all fish in 0.5 hr.
		09/07/76	grab	M1-S-43	<10%	8.5	340	- 10% killed all fish in 0.5 hr.
		09/07/76	grab	M1-S-46	2.0%	8.5	340	- unaerated
		09/07/76	grab	M1-S-47	2.0%	8.5	340	
		06/06/77	grab	M1-S-19	<5%	9.2	265	- unaerated 5% killed all fish in 0.5 hr.
		06/06/77	grab	M1-S-19b	<100%	9.2	265	- 100% killed all fish in 0.5 hr.
		06/06/77	grab	M1-S-20	1.4%	9.2	265	- unaerated-LC50 range 1-2%
		07/24/78	12hr comp.	M2-S-196	2.45%	7.85	290	- LC50 range 2-3%
		07/25/78	12hr comp.	M2-S-204	0.88%	7.03	260	
		07/25/78	12hr comp.	M2-S-211	1.3%	7.0	200	
		07/26/78	12hr comp.	M2-S-212	1.4%	7.6	240	- LC50 range 1-2%
		07/26/78	12hr comp.	M2-S-214	1.3%	7.7	230	
		07/27/78	12hr comp.	MS-S-215	1.2%	8.0	210	- LC50 1-1.5%
		07/27/78	12hr comp.	MS-S-224	1.3%	8.2	240	
		07/28/78	14.5hr "	M2-S-225	1.18%	8.0	220	
		07/28/78	grab	M2-S-234	0.93%	7.65	250	
		07/27/78	grab	M2-S-237	1.17%	8.35	250	
		07/10/79	24hr comp.	S-96	2.1%	9.2	315	
		07/11/79	24hr comp.	S-100	2.4%	9.1	285	- LC50 range 2-3%
		07/12/78	24hr comp.	S-98	2.37	9.3	305	
		07/13/78	24hr comp.	S-102	3.9%	8.6	205	- LC50 range 2-5%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
ALGOMA STEEL - S.S. Marie (NE)	Don Thickener	09/13/76	grab	M1-S-55	<10%	10.7	330	- unaerated 10% killed all fish in 0.5 hours. pH adjusted to 8.0
		09/13/76	grab	M1-S-56	<10%	10.7	330	- unaerated 10% killed all fish in 0.5 hours
		09/13/76	grab	M1-S-57	3.5%	10.7	330	" " "
		09/13/76	grab	M1-S-58	2.4%	10.7	330	- unaerated 10% killed all fish in 0.5 hours
		06/06/77	grab	M1-S-17	N.L.*	9.6	170	- " pH adjusted to 7.0 * at 50%
		06/06/77	grab	M1-S-17b	<100%	9.6	170	- 100% killed all fish in 4 hours
		06/06/77	grab	M1-S-18	N.L.*	9.6	170	- unaerated * at 10%
		07/25/78	24hr comp.	M2-S-205	1.75%	8.0	380	
		07/26/78	24hr comp.	M2-S-209	2.7%	8.5	260	
		07/27/78	24hr comp.	M2-S-223	4%	9.0	250	- LC50 3-5%
		07/28/78	grab	M2-S-226	3.5%	9.9	195	
		07/27/78	grab	M2-S-235	7.0%	10.75	239	- LC50 range 5-10%
		07/10/79	24hr comp.	S-95	N.L.*	8.5	240	- * at 20%
		07/11/79	24hr comp.	S-97	N.L.*	8.3	250	- * 20%
		07/13/79	24hr comp.	S-101	N.L.	8.5	230	
		07/13/79	grab	S-103	N.L.	8.7	220	
		07/13/79	grab	S-104	N.L.	8.1	170	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
ALGOMA STEEL - S.S. Marie (NE)	Bar & Strip Mill (pre-lag)	07/24/78	4hr grab	M2-S-190	N.L.	6.5	120	
		07/27/78	comp. grab	M2-S-217	N.L.	7.3	95	
	Bar & Strip Mill (final)	07/24/78	4hr grab	M2-S-189	N.L.	7.0	150	
		07/25/78	grab	M2-S-198	N.L.	7.5	180	
		07/27/78	grab	M2-S-216	N.L.	7.0	115	
		07/28/78	grab	M2-S-233	N.L.	7.35	135	
	60" Blast Furnace Sewer	07/24/78	comp. of grabs	M2-S-191	N.L.	6.7	110	
		07/25/78	grab	M2-S-199	N.L.	7.7	160	
		07/26/78	grab	M2-S-207	N.L.	6.0	140	
		07/27/78	grab	M2-S-218	N.L.	7.5	95	
		07/28/78	grab	M2-S-232	N.L.	7.6	130	
	30" Blast Furnace Sewer	07/24/78	comp. of grabs	M2-S-192	N.L.	6.65	150	
		07/25/78	grab	M2-S-200	N.L.	7.6	200	
		07/26/78	grab	M2-S-208	N.L.	5.4	200	
		07/27/78	grab	M2-S-219	N.L.	7.2	145	
		07/28/78	grab	M2-S-231	N.L.	6.85	235	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
ALGOMA STEEL - S.S. Marie (NE)	B.O.F. Cooling Water	07/24/78	grab	M2-S-197	N.L.	8.1	140	
		07/28/78	grab	M2-S-230	N.L.	7.65	145	
	Intake	07/25/78	24hr comp.	M2-S-206	N.L.	7.7	140	
		07/26/78	24hr comp.	M2-S-210	N.L.	7.2	180	
		07/25/78	24hr comp.	M2-S-222	N.L.	7.9	90	
		07/28/78	24hr comp.	M2-S-227	N.L.	7.7	130	
	Cold Mill Basin	07/24/78	comp. of grabs	M2-S-194	N.L.	7.0	105	
		07/25/78	grab	M2-S-202	N.L.	7.8	160	
		07/27/78	grab	M2-S-220	N.L.	7.6	100	
		07/28/78	grab	M2-S-229	N.L.	7.6	140	
	Cold Mill Sewer	09/13/76	grab	M1-S-54	N.L.	6.9	140	- unaerated
		06/06/77	grab	M1-S-21	N.L.	6.9	160	- unaerated
		06/06/77	grab	M1-S-21b	N.L.	6.9	165	
	Tube Division	07/24/78	comp. of grabs	M2-S-193	N.L.	6.8	110	
		07/25/78	grab	M2-S-201	N.L.	7.7	160	
		07/26/78	grab	M2-S-213	>100%	7.4	140	- 40% mortality in 100%

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
ALGOMA STEEL - S.S. Marie (NE)	Cold Mill Acid Sewer	07/24/78	comp. of grabs	M2-S-195	35%	3.5	680	- LC50 range 30-40%
		07/25/78	grab	M2-S-203	5.2%	2.2	400	
		07/27/78	grab	M2-S-221	39%	4.4	360	- LC50 range 30-50%
		07/27/78	grab	M2-S-236	30.2%	3.9	850	- LC50 range 20-50%
		07/28/78	grab	M2-s-228	14.3%	3.4	940	- LC50 range 10-20%
ALLIED CHEMICALS - Amherstberg (SW)	Main Plant Sewer	grab	03/28/77	S-49	N.L.	8.4	1300	
	North Drainage	grab	03/28/77	S-50	17%	11.4	41000	- LC50 range 10-30%
AMERICAN CAN OF CANADA - Marathon (NW)	Excess Bleach Plant Filtrate (inplant sample)	09/28/78	4hr comp.	S-128	0.55%	9.7	1750	- pH adjusted to 6.3 - LC50 range 0.3-1%
	Machine Room Effluent (in- plant samples)	09/28/78	4hr comp.	S-129	N.L.	9.3	195	- pH adjusted to 6.3

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
AMERICAN CAN OF CANADA - Marathon (NW)	Effluent to Clarifier (inplant sample)	09/28/78	4hr comp.	S-130	22.6%	10.4	495	- pH adjusted to 6.0
	Caustic Filt- trate (inplant sample)	09/28/78	4hr comp.	S-127	49.9%	9.1	2200	- pH adjusted to 6.3
	#2 Evapora- tor Condensate (inplant sample)	09/28/78	4hr comp.	S-123	N.L.	9.5	125	- pH adjusted to 6.3
		09/28/78	4hr comp.	S-138	16.6%	9.5	125	- pH adjusted to 6.6
	Recovery Furnace Sewer including bark press effluent (inplant sample)	09/28/78	4hr comp.	S-137	53.3%	10	560	- pH adjusted to 6.3
	Barkpress (inplant sample)	09/28/78	4hr comp.	S-135	49%	6.8	125	- pH adjusted to 6.2 - LC50 range 30-80%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
AMERICAN CAN OF CANADA - Marathon (NW)	Recovery Furnace Sewer (inplant sample)	09/28/78	4hr comp.	S-136	>68%	11.1	730	- pH adjusted to 6.3 - 33% mortality in 68%
	Woodroom Effluent (inplant sample)	09/28/78	4hr comp.	S-134	N.L.*	6.9	100	- pH adjusted to 6.2 * at 80%
	Combined Mill Effluent	05/09/78	8hr comp.	S-56	>100%	8.1	1050	- 10% mortality in 100%
		09/28/78	4hr comp.	S-133	55.6%	5.9	1400	- pH adjusted to 6.1
		10/14/79	comp. of grabs	S-190	59%	6.2	13000	
	Main Mill Effluent (inplant sample)	05/09/78	8hr comp.	S-59	51%	10.54	1020	- LC50 range 45-65%
		05/09/78	8hr comp.	S-60	<100%	10.54	1020	- pH adjusted to 7.6 100% killed all fish in 48 hrs.
		09/28/78	4hr comp.	S-132	63%	9.9	1370	- pH adjusted to 6.3 - LC50 range 50-80%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
AMERICAN CAN OF CANADA - Marathon (NW)	Effluent from Clarifier (inplant sample)	09/28/78	4hr comp.	S-131	63%	10.4	500	- pH adjusted to 6.3 LC50 range 50 - 80%
	Acid Bleachery (inplant sample)	05/09/78	8hr comp.	S- 57	25.5%	2.55	1800	- pH adjusted to 7.4
		05/09/78	8hr comp.	S- 58	35%	2.55	1800	
	Caustic Bleacher (inplant sample)	05/09/78	8hr comp.	S- 61	24.5%	11.7	1900	- LC50 range 20-30%
		05/09/78	8hr comp.	S- 62	41%	11.7	1900	- pH adjusted to 7.8%
	Main Mill Sump (inplant sample)	05/09/78	8hr comp.	S- 63	41.6%	9.82	470	- pH adjusted to 7.7 100% killed all fish in 24 hrs.
		05/09/78	8hr comp.	S- 64	<100%	9.82	470	
	Foul Water from Digester Blow (inplant sample)	09/28/78	4hr comp.	S-121	3.2	9.7	270	- LC50 range 2-5% pH adjusted to 6.3

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
AMERICAN CAN OF CANADA - Marathon (NW)	#1 Evaporator Condensate (inplant sample)	09/28/78	4hr comp.	S-122	3.2%	10.3	790	- LC50 range 2-5% pH adjusted to 6.3
	Condensate from Surface Condensor (inplant sample)	09/28/78	4hr comp.	S-124	1.8%	10.5	1380	- pH adjusted to 6.3
	Unbleached White Water (inplant sample)	09/28/78	4hr comp.	S-125	8%	11.6	1110	- pH adjusted to 6.3
	Acid Filtrate (inplant sample)	09/28/78	4hr comp.	S-126	10%	1.9	3950	- pH adjusted to 6.2
ASHLAND OIL - Mississauga (C)	Holding Lagoon	06/01/76	grab	S-102	0.01%			- unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
ATLAS STEEL CO. LTD. - Welland (WC)	52" Sewer	09/10/74	grab	N.L.				- unaerated P.Promelas test organism
	36" Sewer	09/10/74	grab	N.L.				- unaerated P.Promelas test organism
	Patterson Ave. Sewer	09/10/74	grab	N.L.				- unaerated P.Promelas test organism
	Intake (Service Water)	09/10/74	grab	N.L.				- unaerated P.Promelas test organism
AULTS - Winchester (SE)	North Lagoon Outfall	09/15/77	grab	M2-S-152	27.5%	8.4	2150	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
AULTS - Winchester (SE)	Final Lagoon Outfall	07/06/76	8 grabs	M2-S-23	74%	8.25	2750	- unaerated LC50 range 56-100%
		07/07/76	8 grabs	M2-S-24	74%	8.25	2800	- unaerated LC50 range 56-100%
		07/08/76	8 grabs	M2-S-25	74%	8.25	2400	- unaerated LC50 range 56-100%
		09/28/76	8 grabs	S-205	<50%	8.35	2500	- unaerated 50% killed 90% of all fish in 72 hrs.
		09/28/76	8 grabs	S-206	<100%	8.35	2500	- 100% killed all fish in 2 hours
		09/29/76	8 grabs	S-207	<50%	8.4	2700	- unaerated 50% killed all fish in 48 hours
		09/29/76	8 grabs	S-208	<100%	8.4	2700	- 100% killed all fish in 2 hours
		09/30/76	8 grabs	S-209	<50%	8.4	2700	- 50% killed all fish in 72 hours - unaerated
		09/30/76	8 grabs	S-210	<100%	8.4	2700	- 100% killed all fish in 1.5 hrs.
		01/12/77	3 x 8hr comp.	S-3	7.5%	7.7	2600	- LC50 range 5-10%
		01/13/77	" "	S-4	7.5%	7.5	2550	- LC50 range 5-10%
		01/14/77	" "	S-5	14%	7.6	2600	- LC50 range 10-20%
	South Lagoon Outfall	10/17/78	grab	M2-S-309	>100%	8.0	1800	- unaerated 5% mortality in 100%
		10/17/78	grab	M2-S-310	N.L.	8.0	1800	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
BAKELITE THERMOSETS - Belleville (SE)	West Ditch	07/05/76	grab	M2-S-21	N.L.			
		07/06/77	grab	M2-S-61	N.L.	7.2	220	
	East Ditch	05/03/76	grab	S-76	N.L.	7.9	180	
		07/06/77	grab	M2-S-62	N.L.	9.4	205	
BASF - Wyandotte, Mich. (SW)	South Effluent	03/28/77	grab	S-48	7%	12	46500	- LC50 range 5-10%
	North Effluent	03/28/77	grab	S-47	6.1%	11.8	110000	
BEAVER CHARCOAL - North Bay (NE)	Main Effluent -Tailings Pond at Dam	06/21/76	grab	M1-S-13	>100%	7.1	55	- unaerated 30% mortality in 100%
	Phenol Pond	08/23/77	grab	M1-S-109	10%	6.1	145	- unaerated
		08/23/77	grab	M1-S-110	<100%	6.1	145	- 100% killed all fish in 0.5 hour

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
BEAVER WOOD FIBRE CO. LTD. - Thorold (WC)	Final Effluent	05/17/76	grab	S-87	60%	7.7	440	- unaerated
	(at Clarifier)	05/17/76	grab	S-86	60%	7.7	440	
BELL NORTHERN RESEARCH - Ottawa (SE)	Discharge from Lagoon (Mill Plant)	06/20/77	grab	M2-S-34	N.L.	6.9	380	- unaerated
	Discharge from Lagoon (Central Lab)	06/20/77	grab	M2-S-35	N.L.	9.7	450	- unaerated
B.F. GOODERICH - Niagara Falls (WC)	Final Effluent (from aerated pond)	03/15/76	grab	S-24	< 100%	9.0	- 100% killed all fish in 49 hours	
	Settling Pond on Co. Property (South side)	02/23/76	grab	S-9	N.L.	8.5	460	- unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
BOISE-CASCADE CANADA LIMITED - Fort Frances (NW)	Final Effluent	07/26/77	grab	M1-S-79	<10%	6.4	1200	- 10% killed all fish in 48 hours
		08/13/79	grab	S-137	32%	7.0	1750	
	Intake (Service Water)	08/13/79	grab	S-136	N.L.	7.5	47	
- Kenora (NW)	White Water Clarifier (Inplant sample)	11/20/79	grab	S-206	24%	6.0	425	- LC50 range 18-33%
	Mg Sulfite (Inplant sample)	19/11/79	24hr comp.	S-205	3%	4.3	1100	- LC50 range 1.8-5%
	Raw Water (Intake)	11/20/79	grab	S-204	N.L.	6.9	85	
	Final Effluent	07/25/77 11/19/79	grab 24hr comp.	M1-S-73 S-207	50% 16%	6.1 6.2	310 700	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
BORG WARNER - Coburg (C)	Clarifier	02/16/76	grab	S-3	42%	7.6	1500	- LC50 range 32-56% unaerated
BRITISH PETROLEUM (BP) - Oakville (C)	Final Holding Pond	06/11/79 06/11/79	grab grab	S-58 S-60	>100% >100%*	8.3 8.3		- 15% mortality in 100% - * 24hr test-10% mortality in 100%
BULORE MINE - Red Lake (NW)	Madison Tailings Pond Decant	07/16/79	grab	S-105	N.L.	7.4	480	- unaerated
CAMPBELL RED LAKE MINE - Red Lake (NW)	Tailings Pond Decant	07/16/79	grab	S-109	0.21%	8.9	1700	- LC 50 range 0.1-0.5% unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
CANADA STARCH - Cardinal (SE)	Combined #2 Plant & Lagoon (Discharge Point to St. Lawrence R.)	09/03/76	grab	M2-S-59	70%	6.9	255	- unaerated
		07/13/77	grab	M2-S-65	N.L.	7.0	480	
	Total Solvent Sewer	06/21/76	grab	M2-S-11	20%	7.55	260	- unaerated
		07/07/76	grab	M2-S-19	80%	7.8	285	- unaerated
		09/03/76	grab	M2-S-57	N.L.	7.45	265	- unaerated
		07/13/77	grab	M2-S-63	N.L.	7.6	275	
	24" Sewer	06/21/76	grab	M2-S-12	N.L.	7.4	360	- unaerated
		09/03/76	grab	M2-S-61	N.L.	7.8	370	- unaerated
		07/13/77	grab	M2-S-64	N.L.	7.4	325	
CANADA STARCH - Cardinal (SE)	#2 Plant Sewer	06/21/76	grab	M1-S-13	45%	7.7	260	- LC50 range 32-56% - unaerated
		09/03/76	grab	M2-S-60	74%	7.5	265	- LC50 range 56-100% - unaerated
		07/13/77	grab	M2-S-67	N.L.	7.5	270	
	Treatment Lagoon	09/03/76	grab	M2-S-58	32%	6.7	470	- unaerated
		07/19/77	grab	M2-S-66	N.L.	7.0	600	
	Immed. prior to lagoon effl. mixing with #2 plant sewer effluent	07/05/76	grab	M2-S-20	14%	7.0	640	- unaerated LC50 range 10-18%

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
CANADAKA MINES - Elliot Lake (NE)	Discharge of Tailings Ponds	07/20/77 07/20/77	grab grab	M1-S-63 M1-S-64	N.L. N.L.	7.6 7.6	656	- unaerated
CANADIAN INDUSTRIES LTD. C.I.L. - Cornwall (SE)	LEL-2 Sewer	12/05/79 12/06/79 12/06/79	grab grab grab	S-220 S-221 S-224	N.L. 71% N.L.	10.4 3.5 3.5	2000 3500 3500	pH was adjusted to 6.0
- Corunna (SW)	Intake (Service Water)	07/12/76	grab	S-150	N.L.	8.2	170	- unaerated
	Effluent Fore- bay in St. Clair River	07/12/76	grab	S-156	N.L.	7.45	210	- unaerated
- Parry Sound (NE)	Final Settling Pond	09/14/76 08/29/77 08/29/77	grab grab grab	M1-S-59 M1-S-113 M1-S-114	>100% 64.4% >100%	8.4 4.5 4.5	260 270 270	- unaerated-30% mortality in 100% - unaerated - 30% mortality in 100%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
CANADIAN INDUSTRIES LIMITED (C.I.L.) - Sudbury (NE)	Final Effluent	08/30/77 08/30/77	grab grab	M1-S-115 M1-S-116	36.2% < 100%	9.2 9.2	3200 3200	- unaerated - 100% killed all fish in 1.5 hours.
CANADIAN INTERNATIONAL PAPER (C.I.P.) - Hawkesbury (SE)	Sludge Holding Pond	08/24/77 08/11/77	grab grab	M2-S-51 M2-S-112	13.5% 40%	3.7 5.3	1165 1350	- unaerated LC50 range 10-18%
	Outfall of Main Lagoon	08/11/77	grab	M2-S-111	18%	3.5	1200	
	Settling Pond	08/24/76	grab	M2-S-50	10.5%	4.9	320	- unaerated
CANADIAN SMELTING & REFINERY - North Bay (NE)	Lagoon	07/20/77 07/20/77	grab grab	M1-S-69 M1-S-70	N.L. N.L.	7.9 7.9	940 940	- unaerated

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
CELANESE - Cornwall (SE)	Final Effluent	08/10/76 07/12/77	grab grab	M2-S-39 M2-S-69	N.L. N.L.	7.57 7.4	280 290	- unaerated
- Millhaven (SE)	Sewer Manhole (Central Outfall)	06/07/76 08/03/76 05/31/77	grab grab grab	M2-S-1 M2-S-37 M2-S-6	N.L. N.L. >100%	8.0 7.8 6.9	210 270 285	- unaerated - 10% mortality in 100%
	East Ditch (Cooling Water)	06/07/76 05/30/77	grab grab	M2-S-2 M2-S-7	>100% N.L.	8.05 7.7	275 280	- 30% mortality in 100% unaerated
	West Ditch (Cooling Water)	06/07/76 05/30/77	grab grab	M2-S-3 M2-S-8	>100% N.L.	8.0 7.8	270 280	- 10% mortality in 100% unaerated
CHEMICAL DEVELOPMENT OF CANADA - Longford Mills (C)	Mix of lagoon and cooling water (shore of L. St. John)	05/03/76	grab	S-75	24%	7.1		- unaerated LC50 range 18-32%
	Cooling Water	05/03/76	grab	S-74	N.L.	7.9	110	- unaerated
	Lagoon Discharge	04/20/76 04/20/76 05/03/76	grab grab grab	S-59 S-60 S-73	<10% 0.70% 0.6%	7.75 7.75 7.4	4075 4075	- unaerated 10% killed all fish in 15 min. - unaerated - unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
CHROMASCO - Haley Station (SE)	Final Effl. (40L from West Cr. and 20L of plant effluent)	07/16/76 06/03/77	grab grab	M2-S-29 M2-S-11	N.L. N.L.	8.8 8.7	650 330	- unaerated
	West Ck. Ditch	06/03/77	grab	M2-S-12	38%	9.4	700	- LC50 range 30-50%
CHRYSLER CANADA LTD. - Windsor (SW)	Final Effluent	03/28/77	grab	S-46	<70%	8.2	1240	- 70% killed all fish in 48 hrs.
COBALT CAMP - Farr Creek (NE)	Mill Creek Pond	06/29/76	grab	M1-S-15	N.L.	7.2	180	- unaerated
COCHENOUR WILLAMS MINE - Red Lake (NW)	Tailings Pond decant	07/16/79	grab	S-108	N.L.	9.3	350	- unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
COCHRANE ENTERPRISES - Cochrane (NE)	Main Ditch (Leachate)	07/27/76	grab	M1-S-27	>100%	7.4	1430	- 30% mortality in 100%
		07/27/76	grab	M1-S-26	<10%	7.4	1430	- unaerated 10% killed all fish in 33 hrs.
		08/27/79	grab	S-169	< 2.5%	6.2	910	- unaerated 2-5% killed all fish in 33 hrs.
		08/27/79	grab	S-176	15%	6.2	910	- LC50 range 10-22%
COLLIE WOOLEN MILLS - Appleton (SE)	Pipe Outlet	06/21/77	grab	M2-S-41	14%	5.2	1650	- LC50 range 10-20%
		09/07/77	grab	M2-S-145	16.5%	5.7	360	
	Lagoon Outfall	07/30/76	grab	M2-S-35	16%	7.6	1430	- unaerated
		09/07/77	grab	M2-S-146	21%	6.5	770	
CONSOLIDATED TEXTILES - Alexandria (SE)		04/24/79	grab	S-37	1.6%	6.0	740	- LC50 range 0.5-5%
		04/24/79	grab	S-38	3.3%	6.0	740	- unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
CORBY'S DISTILLERY - Corbyville	Manhole by River	05/30/77	grab	M2-S-4	N.L.	6.8	240	- unaerated 10% mortality in 100%
		06/09/77	grab	M2-S-16	N.L.	8.3	270	
		06/09/77	grab	M2-S-17	>100%	8.3	270	
CORNWALL CHEMICALS - Cornwall (SE)	Manhole #26	12/06/79	grab	S-222	N.L.	8.7	1950	
	Combined Effluent	12/05/79	grab	S-218	87%	3.8	5500	
		12/05/79	grab	S-226	N.L.	3.8	5500	
		12/06/79	grab	S-219	71%	3.2	1650	
		12/06/79	grab	S-227	N.L.	3.2	1650	
CORNWALL MUNICIPAL DISCHARGE - Cornwall (SE)	Manhole in front of chlorination building	08/10/77	grab	M2-S-108	83%	6.7	1000	- LC50 range 70-100%

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
COURTAULDS - Cornwall (SE)	Viscose (#5 Sewer)	08/27/76	grab	M2-S-55	14%	11.65	1800	- unaerated LC50 range 10-18%
		06/27/77	grab	M2-S-46	5.0%	13.2	8800	
		06/27/77	grab	M2-S-54	4.2%	13.2	8800	- pH adjusted to 7.0
		08/16/77	grab	M2-S-117	16%	11.8	2400	- LC50 range 10-25%
		08/16/77	grab	M2-S-123	8.5%	11.8	2400	- pH adjusted to 6.9
		04/24/79	grab	S-31	N.L.*	12.1	2600	- * at 2%
		04/24/79	grab	S-32	3.5%	12.1	2600	- LC50 range 2-5%
								pH adjusted to 7.8
		04/24/79	grab	S-40	3.5%	12.1	2600	- "
	Alkaline (Sulphide) Sewer #4	03/09/76	grab	S-20	2.6%	9.5	1850	- unaerated
		08/16/77	grab	M2-S-116	14%	11.0	3200	
		08/16/77	grab	M2-S-122	31%	11.0	3200	- pH adjusted
		04/24/79	grab	S-33	N.L.	7.3	2050	
	Acid Sewer #6	03/09/76	grab	S-19	2.3%	1.8	11600	- unaerated
		08/27/76	grab	M2-S-54	<1.0%		1800	- " 70% mortality in 1%
		06/27/77	grab	M2-S-47	1.4%	1.2	12000	
		06/27/77	grab	M2-S-52	1.7%	1.2	12000	- pH adjusted to 7.0
		08/16/77	grab	M2-S-118	1.4%	1.9	13200	
		08/16/77	grab	M2-S-124	0.85%	1.9	13400	
		08/16/77	grab	M2-S-125	1.0%	1.9	13400	- pH adjusted
		08/16/77	grab	M2-S-126	1.2%	1.9	13400	- renewed static
		08/16/77	grab	M2-S-127	1.0%	1.9	13400	- diluted with St. Lawrence River water
		08/16/77	grab	M2-S-128	1.5%	1.9	13400	- diluted with St. Lawrence R. water - pH adjusted
		08/16/77	grab	M2-S-134	3.5%	1.9	13400	- H ₂ S treated
		08/16/77	grab	M2-S-136	0.25	1.9	13400	- precipitate from H ₂ S treated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
COURTAULDS - Cornwall (SE) (continued)	Acid Sewer #6 (cont'd)	08/16/77	grab	M2-S-137	0.56%	1.9	13400	- stored 13 days @ 50C
		08/16/77	grab	M2-S-138	0.59%	1.9	13400	- stored 13 days @ 200C
		08/16/77	grab	M2-S-140	0.9%	1.9	13400	- stored 21 days @ 50C
		08/16/77	grab	M2-S-141	1.05%	1.9	13400	- stored 21 days @ 200C
		08/16/77	grab	M2-S-148	1.15%	1.9	13400	- stored 28 days @ 50C
		08/16/77	grab	M2-S-149	1.2%	1.9	13400	- stored 28 days @ 200C
		04/24/79	grab	S-29	1.4%	1.5	22000	- LC50 range 0.5-2.0%
		04/24/79	grab	S-30	<2%	1.5	22000	- pH adjusted to 7.8 - 2% killed 90% of the fish in 96 hrs.
	Process Cleanup Sewer #3	03/09/76	grab	S-18	32%	10.15	490	- unaerated
		06/27/77	grab	M2-S-48	89%	11.1	800	
		08/16/77	grab	M2-S-119	N.L.	7.5	740	
	Acid Recovery (manhole in front of plant parking lot)	08/16/77	grab	M2-S-115	N.L.	7.6	3200	
	50/50: Acid Sewer/#5 Viscose Sewer	08/27/76	grab	M2-S-56	1.7%	1.75	7800	- unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
CYANAMID OF CANADA - Welland (WC)	Thompson's Creek at Garner Rd.	08/27/74			10.8%			- fathead minnows (P. promelas) used - unaerated
		08/19/74			1.8%			- "
		08/11/75			22%			- "
		03/15/76	grab	S-29	21%	8.0	1520	- unaerated
		03/29/76	grab	S-37	4.5%			- unaerated
		03/13/79	grab	S-21	6%	9.5	1000	- LC50 range 2-10%
		03/13/79	grab	S-22	9.4%	9.5	1000	- pH adjusted to 7.4
		03/13/79	grab	S-23	>100%	9.5	1000	- pH adjusted to 7.8 - 1st run Dowex ammonia removed.
		03/13/79	grab	S-24	75%	9.5	1000	- pH adjusted to 7.6 - 2nd run Dowex ammonia removed. LC50 range 50-100%
	36" Sewer	08/27/74			2.85%			- unaerated - fathead minnows (P.promelas) used.
		08/19/74			1.3%			- "
		08/11/75			5.6%			- LC50 range 1-1.8%
		08/11/75			7.5%			- unaerated - fathead minnows (P.promelas) used.
								- unaerated - fathead minnows (P.promelas) used.
		08/11/75			>7.5%			- LC50 range 5.6-10% unaerated - fathead minnows (P. promelas) used 7.5% killed 30% of the fish in 96 hrs.

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
CYANAMID OF CANADA - Welland (WC) (continued)	36" Sewer (cont'd)	/75		CF-6	4%			- continuous flow
		03/15/76	grab	S-27	2.2%	9.4	3300	- unaerated
		03/29/76	grab	S-43	<0.75%			- unaerated 0.75% killed all fish in 1.5 hrs.
		03/13/79	grab	S-17	0.75	10	3000	- LC50 range 0.5-1%
		03/13/79	grab	S-18	3%	10	3000	- LC50 range 1-5% - pH adjusted to 7.8
		03/13/79	grab	S-19	N.L.	10	3000	- pH adjusted to 7.6 - 1 st run of Dowex ammonia removed
	60-70 yds. downstream of 36" Sewer	03/13/79	grab	S-20	50%	10	3000	- pH adjusted to 7.5 - 2nd run of Dowex ammonia removed.
		03/15/76	grab	S-28	<100%	9.2	345	- unaerated - 100% killed all fish in 1 hr.
		03/29/76	grab	S-44	<100%			- unaerated - 100% killed all fish in 0.5 hr.
	at Moya Road Bridge upstream of Cyanamid	03/15/76	grab	S-25	N.L.	7.9	270	- unaerated
		03/29/76	grab	S-41	M.L.			- unaerated

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
CYANAMID OF CANADA - Welland (WC) (continued)	Thompson Cr. - downstream	03/29/76	grab	S-40	<100%			- unaerated 100% killed all fish in 0.5 hr.
	Upstream of pumphouse on Thompson Creek	03/29/76	grab	S-39	13.5%			- unaerated
	18" Amano1 Sewer to Thompson Creek	03/29/76	grab	S-38	<1.0%			- unaerated 1% killed all fish in 1.5 hr.
	Upstream of Cyanamid - Thompson Creek	03/29/76	grab	S-36	N.L.			- unaerated
	Miller's Creek at Thorold Townline Rd.	03/13/79	grab	S-26	N.L.	8.3	220	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
CYANAMID OF CANADA - Welland (WC) (continued)	Intake	08/27/74			N.L.			- unaerated - fathead minnows (P.promelas) used
		08/11/75			N.L.			"
		03/15/76	grab	S-26	>100%	8.0	275	- 10% mortality - 100% - unaerated
		03/29/76 03/13/79	grab grab	S-42 S-25	N.L. N.L.	7.5	210	- unaerated
DELOORO SMELTING & REFINING - Deloro (SE)	Final Effluent	06/14/76	grab	M2-S-6	56%	2.9	1210	- unaerated
		05/27/77	grab	M2-S-1	70%	4.7	940	- LC50 range 50-100%
	Moira River at Malone Bridge	06/14/76	grab	M2-S-7	N.L.	8.0	215	- unaerated
		05/27/77	grab	M2-S-2	N.L.	7.7	210	
	Moira River at Hwy. 17	06/14/78	grab	M2-S-8	N.L.	8.25	215	
		05/27/78	grab	M2-S-3	N.L.	7.8	190	
DENISON MINE - Denison Property (NE)	Dunlop Lake Intake (D-10)	06/20/79	grab	S-79	N.L.	6.0	340	- unaerated
		08/22/79	grab	S-161	N.L.	6.3	360	- unaerated

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
DENISON MINE - Denison Property (NE)	Stollery Lake outflow (D-05)	08/23/76	grab	M1-S-38	75%	8.1	2800	- unaerated LC50 range 50-100%
		07/20/77	grab	M1-S-59	56%	8.0	3200	- unaerated
		07/20/77	grab	M1-S-60	<100%	8.0	3200	- 100% killed all fish in 33hrs.
		06/20/79	grab	S-78	N.L.	6.7	240	- unaerated
		08/22/79	grab	S-160	N.L.	7.5	2000	- unaerated
	Tailings Effl. after Barium treatment at Dam 8 (D-02)	06/20/79	grab	S-77	56%	8.7	2700	- unaerated LC50 range 30-100%
		06/20/79	grab	S-90	<70%	8.7	2700	- unaerated - 70% killed all fish in 72 hrs.
		08/22/79	grab	S-158	84%	8.2	2650	- unaerated - LC50 range 70-100%
- Stanrock Property (NE)	(DS-04)	08/22/79	grab	S-163	N.L.	7.7	1500	- unaerated
	Feed to Barium treatment plant (DS-02)	06/20/79	grab	S-81	>10%	1.2	9500	- unaerated-10% mortality in 10% - pH adjusted to 7.8
		06/20/79	grab	S-91	N.L.*	1.2	9500	- pH adjusted to 7.8 * at 50%
	Tailings Effl. after 1st stage settling (DS-01)	06/20/79	grab	S-80	N.L.	8.2	500	- unaerated
		08/22/79	grab	S-162	<100%	5.4	1700	- unaerated - 100% killed all fish in 48 hrs.
		08/22/79	grab	S-165	N.L.	5.4	1700	- unaerated - pH adjusted to 8.4

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
DENISON MINE - Stanrock Property (NE) (continued)	New Dam overflow	08/16/76	grab	M1-S-35	<10%	2.7	2500	- unaerated - 10% killed all fish in 4 hrs.
		08/16/76	grab	M1-S-36	N.L.	2.7	2500	- pH adjusted to 7.2
		06/20/77	grab	M1-S-31	N.L.	2.4	2400	- pH adjusted to 7.1
		06/20/77	grab	M1-S-32	100%	5.6	2000	unaerated
DICKENSON GOLD MINES - Balmer Lake (NW)	Dickenson Tailings Pond	08/16/78	grab	S-102	<1%	10.1	850	- 1% killed all fish in 24 hrs.
		08/16/78	grab	S-103	0.66%	10.1	850	
		07/16/79	grab	S-106	2.2%	8.3	740	- unaerated LC50 range 1-5%
	Balmer Cr. near Chukuni River	08/15/78	grab	S-90	N.L.	7.0	250	
		07/16/79	grab	S-107	>100%	7.4	425	- unaerated - 10% mortality on 100%
	Chukuni R. upstream of Balmer Creek	08/15/78	grab	S-91	N.L.	7.9	46	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
DICKENSON GOLD MINES - Balmer Lake (NW) (continued)	Chukuni River downstream of Balmer Creek	08/15/78	grab	S-92	N.L.	8.0	50	
	Balmer Creek upstream of Balmer Creek	08/16/78	grab	S-100	N.L.	7.2	75	
	Balmer Creek downstream of Balmer Lake	08/16/78	grab	S-101	N.L.	7.1	500	
DOFASCO - Hamilton (WC)	Blast Furnace cooling water with Stretford liquid	10/03/77	grab	S-136	>100% N.L.*	8.0	530	- 30% mortality in 100% - * 48 hr. LC50 at 50%
		10/03/77	grab	S-138				
	Stretford Liquor	10/03/77	grab	S-137	0.09	9.1	90000	
	Lagoon over- flow with Stretford liquor	08/05/75	grab		N.L.			- fathead minnow used (P.promelas)
		10/03/77 10/03/77	grab grab	S-135 S-139	N.L.* N.L.*	8.1	400	- * 24hr. - * 24hr.

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
DOFASCO - Hamilton (WC) (continued)	Blast Furnace cooling water sewer	03/13/78	grab	S-25	<30%	7.4	650	- 30% killed all fish in 48 hrs.
		03/13/78	grab	S-33	24%	7.8	600	
	Bay front cooling water sewer	03/13/78	grab	S-26	38%*	8.0	465	- * 72 hr LC50
		03/13/78	grab	S-34	N.L.	8.0	465	
	Intake (Service Water)	03/13/78	grab	S-27	N.L.*	7.8	445	- * 24 hr.
		08/09/78	grab	S-240	N.L.	7.8	520	
		08/10/78	grab	S-243	N.L.	7.83	500	
		08/11/78	grab	S-247	N.L.	7.9	490	
		08/15/78	grab	S-251	N.L.	8.0	540	
		08/16/78	grab	S-255	N.L.	8.2	490	
		08/17/78	grab	S-258	N.L.	8.0	480	
		08/22/78	grab	S-261	N.L.	7.1	440	
		08/23/78	grab	S-266	N.L.	7.9	490	
		08/24/78	grab	S-269	N.L.	8.2	495	
		08/29/78	24hr comp.	S-275	N.L.	8.0	480	
		08/30/78	24hr comp.	S-279	N.L.	8.5	480	
		08/31/78	24hr comp.	S-283	N.L.	7.8	490	
		09/06/78	24hr comp.	S-285	N.L.	8.5	490	
		09/07/78	24hr comp.	S-289	N.L.	7.3	490	
		09/08/78	24hr comp.	S-293	N.L.	7.5	400	
		09/12/78	24hr comp.	S-299	N.L.	8.0	410	
		09/13/78	24hr comp.	S-303	N.L.	7.7	554	

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DOFASCO - Hamilton (WC) (continued)	Turbo Blower	08/10/78	grab	S-244	N.L.	8.25	50	
		08/11/78	grab	S-248	N.L.	8.2	100	
		09/12/78	grab	S-301	77%	9.2	75	
		09/13/78	grab	S-306	N.L.	8.0	510	
		09/14/78	grab	S-307	N.L.	8.3	500	
	Coke Plant (oven) & Melt Shop	08/05/75	grab		N.L.			- P. Promelas used
		08/05/75	grab		<100%			- unaerated - 100% killed all fish in 4 hrs.
		08/05/75			68.2%			- unaerated
		08/05/75			50%			- unaerated
		08/05/75			38%			- continuous flow
		05/10/76	grab	S-79	<56%	7.7	540	- unaerated - 56% killed all fish in 72 hrs.
		05/10/76	grab	S-80(1)	<10%	8.2	1410	- unaerated - 10% killed all fish in 2 hrs.
		05/10.76	grab	S-80(2)	4.2%	8.2	1410	with ammonium thiocyanate
								- unaerated - with ammonium thiocyanate
		03/13/78	grab	S-24	N.L.*	7.9	480	- * at 50%
		03/13/78	grab	S-32	N.L.	7.9	480	
		08/09/78	grab	S-239	N.L.	7.4	400	
		08/10/78	grab	S-242	N.L.	7.45	610	
		08/11/78	grab	S-246	N.L.	7.8	540	
		08/15/78	grab	S-250	N.L.	7.3	590	
		08/16/78	grab	S-254	N.L.	7.45	540	
		08/17/78	grab	S-260	N.L.	7.3	590	
		08/22/78	grab	S-260	N.L.	7.3	620	
		08/29/78	grab	S-256	100%	7.5	700	

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DOFASCO - Hamilton (WC)	Coke Plant (oven) & Melt Shop (cont'd)	08/29/78	24hr comp.	S-268	N.L.	7.5	600	
		08/30/78	24hr comp.	S-274	N.L.	7.1	580	
		08/31/78	24hr comp.	S-282	N.L.	7.1	600	
		09/07/78	24hr comp.	S-291	N.L.	7.3	480	
		09/08/78	24hr comp.	S-295	N.L.	8.0	490	
		09/12/78	24hr comp.	S-302	N.L.	8.0	470	
		09/13/78	24hr comp.	S-305	N.L.	7.2	560	
		05/10/78	grab	S-90	N.L.	7.35	500	- unaerated
		05/14/76	grab	S-91	N.L.	7.35	590	- unaerated
	Silicon Plant	08/24/78	grab	S-263	89%	9.7	370	- white coloured effluent
		08/24/78	grab	S-272	90%	9.55	430	- green coloured effluent
		08/30/78	grab	S-280	24%	10.8	480	- LC50 range 15-40%
		09/06/78	grab	S-287	>100%	10.0	325	- 20% mortality in 100%
		09/07/78	grab	S-292	>100%	9.5	390	- 30% mortality in 100%
		09/08/78	grab	S-296	78%	9.5	380	
	Boiler House	08/17/78	grab	S-252	N.L.	9.1	630	
		08/23/78	grab	S-262	N.L.	7.5	520	
		08/24/78	grab	S-270	N.L.	8.0	500	
		08/29/78	grab	S-276	N.L.	8.0	490	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DOFASCO - Hamilton (WC) (continued)	Ottawa Street Sewer (slip)	07/10/69	grab	69-36	77.5%			- unaerated, red belly dace used (C. eos)
		08/05/75	grab		N.L.			- fathead minnows used (P.promelas)
		05/10/76	grab	S-81	50%	7.2	355	- unaerated
		08/09/78	grab	S-238	N.L.	8.4	560	
		08/10/78	grab	S-241	N.L.	8.7	510	
		08/11/78	grab	S-245	N.L.	8.3	500	
		08/15/78	grab	S-249	N.L.	8.6	510	
		08/16/78	grab	S-253	N.L.	8.5	470	
		08/22/78	grab	S-259	N.L.	8.3	500	
		08/23/78	grab	S-256	78%	8.4	500	- LC50 range 60-100%
		08/24/78	grab	S-267	N.L.	8.5	500	
		08/29/78	24hr comp.	S-273	100%	8.5	500	
		08/30/78	24hr comp.	S-278	N.L.	7.5	500	
		08/31/78	24hr comp.	S-281	N.L.	8.0	500	
		08/06/78	24hr comp.	S-286	N.L.	8.0	500	
		09/07/78	24hr comp.	S-290	N.L.	8.0	520	
		09/08/78	24hr comp.	S-294	N.L.	8.0	490	
		09/12/78	24hr comp.	S-300	N.L.	8.5	450	
		09/13/78	24hr comp.	S-304	N.L.	8.2	550	
DOMTAR CHEMICALS - Trenton (SE)	Outlet for Oilskimmer	07/06/77	grab	M2-S-57	70%	6.5	235	- LC50 range 50-100%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
DOMTAR CHEMICALS - Trenton (SE)	South Ditch	07/06/77	grab	M2-S-56	N.L.	6.7	570	
DOMTAR FINE PAPERS LTD. - Cornwall (SE)	Discharge of Clarifier	07/23/76	grab	M2-S-32	76%	6.5	950	- unaerated
		06/28/77	grab	M2-S-49	94%	6.4	1400	LC50 range 56-100%
DOMTAR PACKING LTD. - Red Rock (NW)	Final Effluent	06/16/75			28%			- steam stripper not in operation - unaerated
		06/24/75			49%			- unaerated
		07/07/75			24.8%			- unaerated, continuous flow
		07/14/75			21.8%			- " " "
		08/02/77	grab	M1-S-80	N.L.	6.5	495	
		09/13/77	grab	M1-S-133(1)	> 100%	8.7	380	- 30% mortality in 100% in 24 hrs.
		09/13/77	grab	M1-S-133(2)	< 65%			- 95% mortality in 65% in 96 hrs.

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DOMTAR PACKAGING LTD. - Trenton (SE)	Process Effluent & Vacuum Seals	05/03/76	grab	S-77	17%	7.1	355	
		05/03/76	grab	S-78	<3.2%	7.1	355	- unaerated - 3.2% killed all fish in 48 hrs.
		09/13/76	grab	M2-S-64	4.2%	7.35	2300	- unaerated
		09/13/76	grab	M2-S-65	13.5%	7.35	2300	- LC50 range 3.2-5.6% - LC54 range 10-18%
	Process Effluent (White Water)	08/23/76	grab	M2-S-48A	7.6%			
		08/23/76	grab	M2-S-48B	<5.6%			- unaerated - 5.6% killed all fish in 48 hrs.
		06/13/77	grab	M2-S-18	24%	7.5	2200	- LC50 range 20-30%
		07/26/77	grab	M2-S-79	28%	7.7	1320	- LC50 range 20-40%
		07/26/77	grab	M2-S-82	33%	8.5	6600	
		03/22/78	grab	M2-S-14	7.2%	7.4	7100	
		05/02/78	grab	M2-S-24	2.3%	8.5	9500	
	Economizer Pad Drainage	09/13/76	grab	M2-S-66	N.L.	6.9	35	- unaerated
		06/13/77	grab	M2-S-23	N.L.	7.9	240	- unaerated
		03/22/78	grab	M2-S-9	N.L.	7.4	260	
	Vacuum Pump Seals Over- flow	05/02/78	grab	M2-S-19	24%	8.5	2950	
	Sulphite Liquor	03/08/76	grab	S-30	<0.75%	7.25	350	- unaerated - 0.75% killed all fish in 44 hrs.
		03/08/76	grab	S-31	6.6%	7.5	350	
	Vacuum Pump Seal	06/13/77	grab	M2-S-22	14%	8.1	940	- LC50 range 10-20%
		07/26/77	grab	M2-S-83	13%	7.8	2700	
		03/27/78	grab	M2-S-13	N.L.	7.3	430	
		05/02/78	grab	M2-S-23	52%	7.9	730	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DOMTAR PACKAGING LTD. - Trenton (SE) (continued)	Digester Drains	09/13/76	grab	M2-S-68	<100%	8.95	855	- unaerated - 100% killed all fish in 12 hrs.
		06/13/77	grab	M2-S-19	N.L.	9.0	320	
		07/26/77	grab	M2-S-84	N.L.	7.0	190	
		03/22/78	grab	M2-S-10	N.L.	9.3	630	
		05/02/78	grab	M2-S-20	N.L.	9.7	500	
	Economizer Effluent	09/13/76	grab	M2-S-67	N.L.	7.5	190	
		06/13/77	grab	M2-S-24	N.L.	7.8	220	
		07/26/77	grab	M2-S-81	N.L.	6.2	190	
		03/22/78	grab	M2-S-8	N.L.	7.7	750	
		05/02/78	grab	M2-S-18	N.L.	7.4	220	
	Cooling Water	09/13/76	grab	M2-S-70	N.L.	7.8	190	- unaerated - unaerated
		06/13/77	grab	M2-S-25	N.L.	7.5	230	
		07/26/77	grab	M2-S-80	N.L.	8.5	270	
		03/22/78	grab	M2-S-11	N.L.	8.1	365	
		05/22/78	grab	M2-S-21	N.L.	7.4	220	
	Combined Sample	06/13/77	a series of grabs	M2-S-26	47%	8.3	820	- LC50 range 30-50%
		07/26/77	"	M2-S-87	76%	8.8	690	
		03/22/78	"	M2-S-15	39%	7.7	1470	
		05/02/78	grab	M2-S-25	25%	8.6	1575	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DOMTAR PACKAGING LTD. - Trenton (SE) (continued)	Boiler House	09/13/76	grab	M2-S-69	<100%	11.05	625	- 100% killed all fish in 1.5 hr.
		06/13/77	grab	M2-S-20	44%	11.3	640	- LC50 range 30-65%
		06/13/77	grab	M2-S-21	N.L.*	11.3	640	- pH adjusted to 7.0 * at 65%
		07/26/77	grab	M2-S-85	56%	10.8	580	
		07/26/77	grab	M2-S-86	N.L.	10.8	580	- pH adjusted to 6.7
		03/22/78	grab	M2-S-12	28%	11.1	910	- LC50 range 20-40%
		05/02/78	grab	M2-S-22	40%	12.2	940	
DOUGLAS AIRCRAFT - Malton (C)	Final Effluent	06/02/75	grab		N.L.			- unaerated
DOW BADISCHE - Arnprior (SE)	Storm Sewer Manhole	07/30/76	grab	M2-S-34	N.L.	7.5	130	- unaerated
		06/03/77	grab	M2-S-13	N.L.	7.4	135	- unaerated
	Process Sewer Manhole	07/30/76	grab	M2-S-36	80%	6.6	135	- unaerated
		06/03/77	grab	M2-S-14	N.L.	7.9	140	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DOW CHEMICAL - Sarnia (SW)	3rd Street Sewer	03/03/76	grab	S-13	N.L.	8.6	260	- unaerated
		06/21/76	grab	S-118	N.L.	8.9	290	- unaerated
		05/10/77	grab	S-68	N.L.	8.2	180	
		05/31/77	grab	S-84	N.L.	9.0	300	
		06/21/77	grab	S-117	N.L.	8.1	200	
		07/12/77	grab	S-124	N.L.	7.7	430	
		07/11/78	grab	S-76	> 100%	8.0	210	- unaerated - 20% mortality in 100%
		07/11/78	grab	S-77	N.L.	8.0	210	
		09/13/78	grab	S-109	N.L.	7.7	210	
		09/13/78	grab	S-110	N.L.	7.7	210	- unaerated
	54" Sewer (1st Sluice)	06/21/76	grab	S-121	86%	7.55	380	- unaerated
		07/19/76	grab	S-160	> 100%	8.7	300	- 10% mortality in 100%
		05/10/77	grab	S-69	N.L.	9.4	1240	
		05/31/77	grab	S-85	N.L.	8.1	820	
		06/21/77	grab	S-118	N.L.	8.4	220	
		07/12/77	grab	S-123	N.L.	7.6	910	
		07/11/78	grab	S-74	N.L.	7.8	280	- unaerated
		07/11/78	grab	S-75	N.L.	7.8	280	
		09/13/78	grab	S-107	< 100%	10.2	780	- 60% mortality in 100%
		09/13/78	grab	S-108	> 100%	10.2	780	- 40% mortality in 100% unaerated
	Acid Drain	03/02/76	grab	S-14	36%	11.1	2900	- unaerated
		06/21/76	grab	S-125	8.6%	12.0	6600	- unaerated LC50 range 5.6 - 13.6%
		06/21/76	grab	S-128	> 100%	12.0	66000	- unaerated 10% mortality in 100% pH adjusted to 7.2

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
DOW CHEMICAL - Sarnia (SW) (continued)	42" Sewer	06/21/76	grab	S-123	>100%	8.25	235	- unaerated, 20% mortality 100%
		10/18/76	grab	S-216	N.L.			- unaerated
		10/18/76	grab	S-217	>100%			- 10% mortality in 100%
	Intake (Service Water)	10/18/76	grab	S-214	N.L.			- unaerated
		10/18/76	grab	S-215	N.L.			
	D.O.E.O.	06/28/76	grab	S-134	N.L.	8.25	175	- unaerated
		10/18/76	grab	S-224	N.L.			- unaerated
		10/18/76	grab	S-225	>100%			- 20% mortality in 100%
	Steam Plant	06/28/76	grab	S-133	N.L.	8.1	175	- unaerated
		10/18/76	grab	S-226	>100%			- unaerated
		10/18/76	grab	S-227	N.L.			10% mortality in 100%
	4th Street Sewer	06/21/76	grab	S-120	N.L.	8.2	2500	- unaerated
		10/18/76	grab	S-222	N.L.			- unaerated
		10/18/76	grab	S-223	>100%			- 10% mortality in 100%
	2nd Street Sewer	06/21/76	grab	S-119	N.L.	9.8	170	- unaerated
		10/18/76	grab	S-220	>100%			- unaerated
		10/18/76	grab	S-221	>100%			20% mortality in 100% - 10% mortality in 100%
	48" Sewer	06/21/76	grab	S-122	N.L.	8.7	180	- unaerated
		10/18/76	grab	S-218	>100%			- unaerated 10% mortality in 100%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DUPONT OF CANADA - Corunna (SW)	Final Effluent	07/12/76	grab	S-157	N.L.			- unaerated
- Kingston (SE)	Final Plant Effluent	06/16/77 06/16/77	grab grab	M2-S-29 M2-S-30	N.L. N.L.	8.8 8.8	280 280	- unaerated
- Maitland (SE)	Total Process Effluent	03/09/76 08/16/76	grab grab	S-21 M2-S-46	38% 42%	7.05 8.25	600 415	- unaerated - unaerated LC50 range 32-56%
	Mixing Chamber before discharge to river	06/16/77 08/08/77	grab grab	M2-S-31 M2-S-106	81% N.L.	9.5 7.8	1100 320	
	Sanitary Sewer (Manhole after Chlorin- ation Plant)	06/16/77 06/16/77	grab grab	M2-S-27 M2-S-28	<100% <100%	7.7 7.7	660 660	- unaerated - 100% killed all fish in 0.5 hrs. - unaerated - 100% killed
	Main Plant (before mixing with T.E.L. plant discharge)	08/08/77	grab	M2-S-105	N.L.	7.6	280	
	T.E.L. Plant (before mixing with main plant)	08/08/77	grab	M2-S-104	N.L.	8.8	1900	

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
DUPONT OF CANADA - North Bay (NE)	Final Effluent	09/20/76 07/11/77 07/11/77	grab grab grab	M1-S-65 M1-S-49 M1-S-50	N.L. N.L. N.L.	7.4 7.3 7.3	155 365 365	- unaerated
DUSSEK BROTHERS - Belleville (SE)	Surface Runoff collection ditch	07/19/76 08/16/76	grab grab	M2-S-30 M2-S-47	16% 13.5%	8.0 7.7	255 280	- unaerated - unaerated LC50 range 10-18%
E.B. EDDY FOREST PRODUCTS LTD. - Espanola (NE)	#1 Bleach Plant (inplant sample)	03/07/77 03/30/77 05/11/77 05/30/77 05/30/77 06/21/77 08/08/77 08/23/77 09/13/77 04/24/78 04/24/78 07/30/79 07/30/79	grab grab grab grab grab grab grab grab grab grab grab grab grab	S-34 S-53 S-76 M1-S-11 M1-S-12 M1-S-38 M1-S-91 M1-S-105 M1-S-125 S-54 S-55 S-116 S-122	13% 14% 14% <10% <65% 14% N.L.* 7.1% N.L.* 24% 37% 13% 28%	2.8 2.6 2.3 2.8 2.8 3.6 6.8 3.0 3.4 2.3 2.3	2000 1700 2800 1650 1650 1020 350 1300 710 1320 1320	- LC50 range 10-20% - LC50 range 10-20% - unaerated - 10% killed all fish in 4 hrs. - 65% killed all fish in 0.5 hrs - LC50 range 10-20% - * at 10% - LC50 range 5-10% - * 24hr - LC50 at 10% - LC50 range 20-30% - pH adjusted - LC50 range 10-28% - pH adjusted to 6.3

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
E.B. EDDY FOREST PRODUCTS LTD. - Espanola (NE)	#2 Bleach Plant (inplant sample)	03/07/77	grab	S-35	8.2%	2.8	3600	
		03/30/77	grab	S-52	14%	6.3	2900	- LC50 range 10-20%
		05/11/77	grab	S-77	23.7%	5.1	3400	
		05/30/77	grab	M1-S-13	<10%	2.8	4000	- unaerated - 10 % killed all fish in 3 hrs.
		05/30/77	grab	M1-S-14	<65%	2.8	4000	- 65% killed all fish in 0.5 hrs.
		06/21/77	grab	M1-S-40	<2%	1.8	8000	- 2% killed all fish in 4 hrs.
		08/08/77	grab	M1-S-92	N.L.*	6.2	410	- * at 10%
		08/23/77	grab	M1-S-106	7.1%	3.8	3300	- LC50 range 5-10%
		09/13/77	grab	M1-S-106	N.L.*	7.0	4000	- * 24hr - LC50 at 10%
		04/24/78	grab	S-50	14%	3.6	3200	- LC50 range 10-20%
		04/24/78	grab	S-51	4.7%	3.6	3200	- unaerated
		04/24/78	grab	S-52	<30%	3.6	3200	- pH adjusted to 7.7 - 30% killed all fish in 48 hrs.
		04/24/78	grab	S-53	<10%	3.6	3200	- pH adjusted to 7.7 - 10% killed all fish in 96 hrs.
		07/30/79	grab	S-117	37.5%	6.5	3600	
- Espanola (NE)	Intake (Power Canal or Service Water)	03/07/77	grab	S-37	N.L.	6.3	140	
		03/30/77	grab	S-54	N.L.	6.4	170	
		05/11/77	grab	S-75	N.L.	6.8	65	
		05/30/77	grab	M1-S-9	N.L.	7.2	62	- unaerated
		05/30/77	grab	M1-S-10	N.L.	7.2	62	
		06/21/77	grab	M1-S-38	N.L.	7.2	120	
		08/09/77	grab	M1-S-94	N.L.	6.6	92	
		08/23/77	grab	M1-S-108	N.L.	6.9	62	
		09/13/77	grab	M1-S-128	N.L.*	6.6	100	- * 72 hr
		04/24/78	grab	S-46	N.L.	7.5	210	
		04/24/78	grab	S-47	N.L.	7.5	210	- unaerated
		07/30/79	grab	S-119	N.L.	7.2	600	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
E.B. EDDY FOREST PRODUCTS LTD. - Espanola (NE)	Final Effluent (Outfall Pond or Whole Mill)	05/31/76	grab	M1-S-2	7.5%	3.2	1500	- LC50 range 5.6-10% unaerated
		05/31/76	grab	M1-S-3	24%	3.2	1500	- LC50 range 18-32% - unaerated pH adjusted to 6.9
		03/07/77	grab	S-36	19%	3.1	1600	
		03/30/77	grab	S-51	84.3%	6.4	1000	
		05/11/77	grab	S-78	35.4%	4.4	1000	
		05/30/77	grab	M1-S-7	14%	7.1	1225	- unaerated LC50 range 10-20%
		05/30/77	grab	M1-S-8	< 65%	7.1	1225	- 65% killed all fish in 12 hrs.
		06/21/77	grab	M1-S-37	17%	6.0	1000	
		08/08/77	grab	M1-S-93	> 10%	9.3	890	- 10% mortality in 10%
		08/23/77	grab	M1-S-107	12%	7.4	1300	
		09/13/77	grab	M1-S-127	23%*	6.7	1200	- from foam pond * 24hr LC50
		04/24/78	grab	S-44	44%	6.8	1250	- LC50 range 30-65%
		04/24/78	grab	S-45	12%	6.8	1250	- unaerated
		04/24/78	grab	S-49	> 45%			- 20% mortality in 45%
		07/30/79	grab	S-114	60%	6.3	940	
	Woodroom	05/31/76	grab	M1-S-4	12%	4.8	175	- unaerated
		05/31/76	grab	M1-S-5	12%	4.8	175	- unaerated - pH adjusted to 7.0
		04/24/78	grab	S-48	11%	4.7	180	
		07/30/79	grab	S-120	4.2%	4.3	210	
		07/30/79	grab	S-121	< 10%	4.3	210	- pH adjusted to 7.1 - 10% killed all fish in 24 hrs.
	Main Sewer (inplant sample)	07/30/79	grab	S-115	42%	5.7	1200	- LC50 range 32-56%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
E.B. EDDY FOREST PRODUCTS LTD. - Espanola (NE)	Kraft Mill (inplant sample)	07/30/79	grab	S-118	42%	10.7	355	- LC50 range 32-56%
- Ottawa (SE)	Speciality Mill (after clarifier)	07/20/77	grab	M2-S-37	<50%	7.7	150	- 50% killed all fish in 72 hrs.
		07/20/77	grab	M2-S-42	65%	7.7	150	
		08/04/77	grab	M2-S-92	N.L.	6.2	115	
		08/04/77	grab	M2-S-93	N.L.	6.0	110	
		08/04/77	grab	M2-S-94	N.L.	6.0	110	
		08/04/77	grab	M2-S-95	N.L.	6.9	110	
		08/04/77	6-gr.comb.	M2-S-100	N.L.	7.2	110	
		09/07/77	grab	M2-S-143	100%	4.8	190	
	Board Mill Sewer	07/20/77	grab	M2-S-36	80%	7.2	160	- LC50 range 65-100%
		08/04/77	grab	M2-S-96	N.L.	5.7	135	
		08/04/77	grab	M2-S-97	90%	5.0	160	- LC50 range 80-100%
		08/04/77	grab	M2-S-98	N.L.	5.2	125	
		08/04/77	grab	M2-S-99	N.L.	5.6	165	
		08/04/77	6-gr.comb.	M2-S-101	N.L.	6.0	150	
		09/07/77	grab	M2-S-144	N.L.	5.5	170	
	Speciality Mill (before clarifier)	08/04/77	grab	M2-S-88	N.L.	6.4	105	
		08/04/77	grab	M2-S-89	N.L.	5.6	105	
		08/04/77	grab	M2-S-90	90%	4.8	105	
		08/04/77	grab	M2-S-91	N.L.	5.6	160	
		09/07/77	grab	M2-S-141	N.L.	5.9	190	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
ELMIRA SEWAGE TREATMENT PLANT - Elmira (WC)	Final Effluent (before chlorination)	09/20/76	grab	S-196	N.L.	7.5	3000	
	Effluent	09/20/76	grab	S-197	38%	7.4	3500	- LC50 range 30-50%
		04/12/77	grab	S-57	59%	7.6	5500	- LC50 range 50-70%
	Influent (mixture of Elmira sewage & Uniroyal effluent)	04/12/77	grab	S-58	58%	7.6	4600	- LC50 range 50-70%
ETHYL CORPORATION - Corunna (SW)	Final Effluent	07/12/76	grab	S-154	N.L.	7.6	1550	- unaerated
		05/10/77	grab	S-70	N.L.	7.5	1800	
		07/11/78	grab	S-78	N.L.	7.7	300	- unaerated
		07/11/77	grab	S-79	N.L.	7.7	300	
		08/22/78	grab	S-104	N.L.	8.2	1440	
		08/22/78	grab	S-105	N.L.	8.2	1440	- unaerated
		08/22/78	grab	S-106	N.L.	8.2	1440	- unaerated - sample agitated at 15°C for 24 hrs. prior to testing
		09/12/78	grab	S-111	N.L.	7.2	1580	
		09/12/78	grab	S-112	N.L.	7.2	1580	- unaerated
	Intake (Service Water)	07/12/76	grab	S-151	N.L.	8.3	210	- unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
FALCONBRIDGE								
- Emery Creek (NE)	Emery Creek (below bridge)	07/14/77 07/14/77	grab grab	M1-S-58 M1-S-57	N.L. N.L.	7.6 7.6	420 420	- unaerated
- Fecunis Lake (NE)	Fecunis Lake	08/15/77 08/15/77	grab grab	M1-S-99 M1-S-100	32% <100%	5.0 5.0	980 980	- unaerated - 100% killed all fish in 72 hrs
- Moose Lake (NE)	Moose Creek Effluent	08/15/77 08/15/77	grab grab	M1-S-95 M1-S-96	13% <100%	4.5 4.5	1100 1100	- unaerated - 100% killed all fish in 96 hrs
	Moose Lake (below treatment plant)	09/08/76	grab	M1-S-48	N.L.	7.0	920	- unaerated
	Moose Lake	07/14/76 09/08/76	grab grab	M1-S-10 M1-S-49	N.L. >100%	6.6 7.0	975 810	- unaerated 20% mortality in 100%
		08/15/77	grab	M1-S-97	>100%	7.5	780	- unaerated 20% mortality in 100%
		08/15/77	grab	M1-S-98	>100%	7.5	780	- 10% mortality in 100%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
FIBERGLASS OF CANADA - Sarnia (SW)	Final Effluent	07/19/76	grab	S-158	N.L.	7.5	195	- unaerated
	Treatment Sump	07/19/76	grab	S-159	17.5%	7.35	13000	- unaerated LC50 range 10-30%
FORD MOTOR CO. - St. Thomas (SW)	Influent to impounding basin (inplant sample)	12/12/78	grab	S-141	N.L.	7.4	460	
	Combined Effluent at Dodd's Cr.	12/12/78	grab	S-142	N.L.	7.3	435	
	East Settling Lagoon (inplant sample)	12/12/78	grab	S-143	52%	7.0	750	- LC50 range 45-50%

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
FORD MOTOR CO. - Windsor (SW)	Riverside Dr. pumping station	03/28/77	grab	S-45	<70%	7.3	430	- 70% killed 70% of fish in 48 hrs.
FREEDLAND INDUSTRIES - Kingsville (SW)	Final Effluent	08/18/75	grab		75%	10.7		
GENERAL MOTORS - St. Catharines (WC)	Creek leading from plant on east side	02/23/76	grab	S-8	N.L.	7.4	470	- unaerated
GENSTAR (BROCKVILLE CHEMICALS) - Brockville (SE)	Surface Runoff (ditch to St. Lawrence R.)	07/05/76	grab	M2-S-18	<10%	8.45	51000	- 10% killed all fish in 0.5 hr. unaerated
		07/05/76	grab	M2-S-22	< 1.0%	8.45	51000	- 1.0% killed all fish in 1 hr. unaerated
		08/16/76	grab	M2-S-45	1.35%			- LC50 range 1-1.8%
		06/16/77	grab	M2-S-32	1.4%	9.1	6300	- LC50 range 1-2%
		08/08/77	grab	M2-S-102	1.7%	9.1	4000	
		08/25/77	grab	M2-S-133	1.8%	8.9	5300	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
GENSTAR (BROCKVILLE CHEMICALS) - Brockville (SE) (continued)	Final Effluent	06/21/76	grab	M2-S-10	<10%	8.5	22000	- unaerated - 10% killed all fish in 0.5 hrs.
		06/21/76	grab	M2-S-14	<1.8%	8.5	22000	- unaerated - 1.8% killed all fish in 1.5 hrs.
		08/16/76	grab	M2-S-44	<0.56%			- unaerated - 0.56% killed all fish in 2 hrs.
		06/16/77	grab	M2-S-33	5.3%	6.6	6500	
		08/08/77	grab	M2-S-103	1.3%	9.7	3400	
		08/25/77	grab	M2-S-132	0.62%	10.3	4600	- LC50 range 0.5 - 0.75%
		08/25/77	grab	M2-S-135	16%	10.3	4600	- treated to remove NH ₃ (single pass)
		08/25/77	grab	M2-S-139	25%	10.3	4600	- treated to remove NH ₃ (double pass)
GREAT LAKES FOREST PRODUCTS LTD. - Thunder Bay (NW)	Effluent (on company property)	07/25/77	grab	M1-S-76	39%	5.9	1350	- LC50 range 30-50%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
GULF OIL - Oakville (C)	Final Effluent (Oily Water Trap #4)	06/04/79	grab	S-52	N.L.*	8.2	880	- * 24hr
		06/04/79	grab	S-55	N.L.	8.2	880	
		12/12/79	grab	S-229	71%	4.0	630	- slop tank spill a few days before caused lethality
		12/17/79	grab	S-231	N.L.	7.75	418	
	Cooling Water	06/04/79	2 gr.comb.	S-51	N.L.*	7.9	285	- * 24hr
		06/04/79	2 gr.comb.	S-56	N.L.	7.9	285	- Traps 1 & 3
		12/12/79	3 gr.comb.	S-228	N.L.	8.35	274	- Traps 1,2 & 3
HAHN BRASS - New Hamburg	Final Effluent	09/02/75	grab		>100%			- unaerated - 40% mortality in 100%
HALEY INDUSTRIES - Haley Station (SE)	Inside #1 Plant	06/03/77	grab	M2-S-9	14%	12.1	9100	- LC50 range 10-20%
	Final Effluent	07/16/76	grab	M2-S-27	N.L.	7.6	780	
		06/03/77	grab	M2-S-10	25%	7.7	400	- LC50 range 20-30%
	#1 Plant Effluent	07/16/76	grab	M2-S-28	N.L.	7.4	330	
		06/03/77	grab	M2-S-15	>100%	12.1	8800	- pH adjusted to 6.6 40% mortality in 100%

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
HOUDAILLE PLATING - Oshawa (C)	Manhole #27	07/21/75	grab		4.7%			- effluent discharge to sanitary sewer - unaerated
	Manhole #50	07/21/75	grab		N.L.			- effluent discharge to sanitary sewer - unaerated
HAWKESBURY MUNICIPAL DISCHARGE - Hawkesbury (SE)	Retaining Area	08/10/77	grab	M2-S-110	100%	7.5	500	
IMPERIAL OIL PETROCHEMICAL PLANT - Sarnia (SW)	Pressure Sewer (Anthracite Filter)	04/13/76	grab	S-58	51%	7.8	240	- unaerated
		06/28/76	grab	S-130	<75%	8.2	275	- 75% killed all fish in 48 hours - unaerated
		07/19/76	grab	S-162	93%	7.3	330	- unaerated
		10/25/76	grab	S-231	N.L.	7.2	2200	
		10/25/76	grab	S-232	N.L.	7.2	2200	- unaerated
		04/18/77	grab	S-62	N.L.	8.0	450	
		05/10/77	grab	S-66	97%	8.8	390	
		05/31/77	grab	S-82	<70%	7.9	440	- 70% killed all fish in 33 hrs.

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
IMPERIAL OIL PETROCHEMICAL PLANT - Sarnia (SW) (continued)	Pressure Sewer	06/21/77	grab	S-119	N.L.	7.5	520	
	Anthracite	07/12/77	grab	S-121	N.L.	8.0	265	
	Filter (cont)	07/11/78	grab	S-70	< 70%	7.9%	200	- unaerated - 70% killed all fish in 96 hrs.
		07/11/78	grab	S-71	< 100%	7.9	200	- 100% killed all fish in 96 hrs.
	Pressure Sewer	06/28/76	grab	S-129	<100%	8.05	250	- unaerated - 100% killed all fish in 24 hrs.
	(Anthracite							
	Filter	04/19/77	grab	S-61	N.L.	7.8	470	
	influent)	05/11/77	grab	S-65	>100%	8.8	370	- 30% mortality in 100%
		05/31/77	grab	S-81	<70%	7.3	400	- 70% killed all fish in 48 hrs.
		07/12/77	grab	S-120	72%	7.9	260	- LC50 range 50-100%
	#9 Separator	06/28/76	grab	S-132	N.L.	7.9	190	- unaerated
		10/25/76	grab	S-239	N.L.	7.5	190	- unaerated
		10/25/76	grab	S-240	N.L.	7.5	190	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
IMPERIAL OIL REFINERY - Sarnia (SW) (continued)	#3 Separator	06/28/76	grab	S-135	N.L.	8.2	175	- unaerated
		10/25/76	grab	S-241	N.L.	7.5	175	
		10/25/76	grab	S-242	N.L.	7.5	175	
	#12 Separator	06/28/76	grab	S-131	N.L.	8.0	175	- unaerated
		10/25/76	grab	S-235	N.L.	8.1	185	
		10/25/76	grab	S-236	>100%	8.1	185	- unaerated - 10% mortality in 100%
	#11 Separator	06/28/76	grab	S-137	N.L.	7.9	180	- unaerated
		10/25/76	grab	S-237	N.L.	7.95	185	
		10/25/76	grab	S-238	N.L.	7.95	185	- unaerated
	Bio-oxidation Plant	06/28/76	grab	S-136	N.L.	7.5	860	- unaerated
		10/25/78	grab	S-233	N.L.	7.65	780	
		10/25/76	grab	S-234	>100%	7.65	780	- unaerated - 30% mortality in 100%
		04/18/77	grab	S-63	N.L.	7.8	720	
		05/10/77	grab	S-67	N.L.	6.6	520	- 100% killed all fish in 72 hrs. - unaerated
		05/31/77	grab	S-83	N.L.	7.5	470	
		06/21/77	grab	S-114	N.L.	7.0	590	
		07/12/77	grab	S-122	N.L.	6.5	635	
		07/11/78	grab	S-72	<100%	7.5	750	
		07/11/78	grab	S-73	N.L.	7.5	750	
		05/29/79	grab	S-48	N.L.*	7.6		- * 24hr test

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
IMPERIAL OIL REFINERY - Sarnia (SW) (continued)	Cooling Water (Separators - #3,9,11 &12 combined)	05/29/79	4-grabs combined	S-49	N.L.*	8.2	190	- * 24 hr test
	Intake	10/25/76	grab	S-229	N.L.	7.4	240	- unaerated
	(Service	10/25/76	grab	S-230	N.L.	7.4	240	
	Water)	05/29/79	grab	S-47	N.L.*	8.3	200	- * 24hr test
INCO - Copper Cliff (NE)	Copper Cliff Creek (upstream of Inco WTP)	05/24/77	grab	M1-S-3	<10%	7.1	2150	- unaerated - 80% mortality in 10%
	Copper Cliff Creek (downstream of Inco WTP)	05/24/77	grab	M1-S-4	23%	7.8	2300	- unaerated
	Final Effluent (below STP)	08/30/77	grab	M1-S-117	>100%	9/6	2600	- unaerated pH adjusted to 6.5 20% mortality in 100%
		08/30/77	grab	M1-S-118	<100%	9.6	2600	- 100% killed all fish in 0.5 hrs.

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
INCO								
- Copper Cliff (NE) (continued)	Final Effluent (to Kelly Lake)	08/30/77	grab	M1-S-121	N.L.	7.5	200	- unaerated - anomalous mortalities in 50%
		08/30/77	grab	M1-S-122	>100%	7.5	200	- 20% mortality in 100%
	North of Hwy #17(at bridge over Copper Cliff Creek)	05/25/76	grab	M1-S-1	18%	9.0	1700	- unaerated
		06/21/76	grab	M1-S-11	<10%	10.4	2400	- unaerated - 10% killed all fish in 4 hrs.
		06/21/76	grab	M1-S-12	24%	10.4	2400	- unaerated - pH adjusted to 7.0 - LC50 range 18-32%
	Creek Effluent from Cu refinery	06/07/76	grab	M1-S-7A	N.L.	9.5	550	- unaerated - pH adjusted to 5.9 - poor temp control after 24 hrs.
		06/07/76	grab	M1-S-7B	N.L.	9.5	550	- unaerated
	3rd Lagoon Effluent	06/07/76	grab	M1-S-6A	<10%	10.3	320	- unaerated - 10% killed all fish in 72 hrs.- poor temp. control after 24 hrs.
		06/07/76	grab	M1-S-6B	<10%	10.3	325	- unaerated - 10% killed all fish in 48 hrs. pH adjusted to 6.6
- Coniston (NE)	Coniston Creek (at point where it enters Whanapatei R. downstream of INCO)	05/24/77	grab	M1-S-6	N.L.	7.8	350	- unaerated
	Coniston Creek at Hwy 17 (upstream of INCO)	05/24/77	grab	M1-S-5	N.L.	7.4	235	- unaerated

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
INCO - Levack (NE)	Tailings Pond Pond	06/14/76	grab	M1-S-8	<10%	8.0	3300	- 10% killed all fish in 44 hrs.
		06/14/76	grab	M1-S-9	4.2%			- LC50 range 3.2-5.6%
- Garson Mine Nolin's Creek (NE)	Nolin Creek (Treatment Plant effluent below pond)	07/14/77	grab	M2-S-53	25%	9.3	1800	- LC50 range 20-30% - unaerated
		07/14/77	grab	M2-S-54	<100%	9.3	1800	- 100% killed all fish in 0.5 hrs.
	Garson Mine Effluent (at culvert by old Hwy 144)	07/14/77	grab	M1-S-55	100%	9.3	1200	- unaerated
		07/14/77	grab	M1-S-56	N.L.	9.3	1200	
		08/30/77	grab	M1-S-119	<10%	4.1	1240	- unaerated
		08/30/77	grab	M1-S-120	<100 %	4.1	1240	- 90% mortality in 10% - 100% killed all fish in 24 hrs.
- Shebandowan Mine (NW)	Shebandowan Mine Effluent	07/25/77	grab	M1-S-74	N.L.	7.4	800	- unaerated
		07/25/77	grab	M1-S-75	N.L.	7.4	800	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
INDUSTRIAL GRAIN PRODUCTS - Thunder Bay (NW)	Final Effluent (Wheat Starch Manufacturer)	08/08/77 08/08/77 08/08/77	grab grab grab	M1-S-89 M1-S-89 M1-S-90	<10% <100% <100%	3.5 3.5 3.5	880 880 880	- unaerated - unaerated pH adjusted to 6.4 - 100% killed all fish in 24 hrs. - 100% killed all fish in 0.5 hrs.
IROQUOIS MUNICIPAL DISCHARGE - Iroquois (SE)	Municipal Discharge	08/10/77	grab	M2-S-107	38%	7.1	1400	- LC50 range 30-50%
ITEA TEXTILES - Cornwall (SE)	Dye Separator Effluent	02/19/79 02/19/79 03/05/79 03/05/79 04/23/79	grab grab grab grab grab	S-11 S-12 S-15 S-16 S-39	15% 15% N.L.* N.L.* 25%	6.0 6.0 6.4 6.4 6.4	390 390 330 330 325	- pH adjusted to 7.8 - * at 40% - pH adjusted to 7.6-* at 40%

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
KAMKOTIA MINE - Timmins (NE)	Mine Outfall	08/06/76	grab	M1-S-32	62%	2.4	3300	- pH adjusted to 7.2 unaerated
		08/06/76	grab	M1-S-33	<10%	2.4	3300	- 10% killed all fish in 3 hrs. - unaerated
		05/16/78	grab	S-65	23%	3.0	930	
		05/16/78	grab	S-66	N.L.	3.0	930	- pH adjusted to 7.5
KANICHEE MINE Temagami (NE)	Tailings Pond	08/23/77	grab	M1-S-111	>100%	7.7	920	- 20% mortality in 100% unaerated
		08/23/77	grab	M1-S-112	N.L.	7.7	920	
KIMBERLY-CLARK OF CANADA - St. Catharines (WC) Final Effluent		05/17/76	grab	S-84	N.L.	7.8	300	- unaerated
		05/17/76	grab	S-85	58%	7.8	300	
		02/28/77	grab	S-29	N.L.	7.1	320	
- Terrace Bay (NW)	Pulp Mill Effluent	08/09/77	grab	M1-S-88	39%	7.1	1250	- LC50 range 30-50%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
KRAFT FOODS Ingleside (SE)	Final Effluent	06/21/76	grab	S-126	35%	8.2	2250	- unaerated
		06/21/76	grab	S-127	27%	8.2	2250	
		06/23/76	8hr grab	M2-S-15	40%	8.3	2475	
		06/24/76	8hr grab	M2-S-16	38%	8.3	2600	
		06/24/76	8hr grab	M2-S-17	24%	8.5	2500	- LC50 range 18-32%
		09/14/76	8hr comp. of grabs	M2-S-71	72%	7.65	165	- unaerated
		09/15/76	"	M2-S-72	> 75%			- unaerated
		09/16/76	"	M2-S-73	70%			- unaerated
		12/07/76	"	S-255	38%*	7.9	2300	- * 48 hr LC50
		12/08/76	"	S-256	70%*	7.9	2500	- * 72 hr LC50
		12/09/76	"	S-257	38%*	7.8	2400	- * 72 hr LC50
		02/21/77	grab	S-24	70%	7.7	2050	- unaerated LC50 range 50-100%
		07/12/77	grab	M2-S-75	N.L.	7.3	395	
	Lagoon prior to chlorin- ation	07/12/77	grab	M2-S-71	17%	8.1	2950	
		07/12/77	grab	M2-S-72	25%	8.1	2950	- unaerated LC50 range 20-30%
		09/05/77	grab	M2-S-151	34%			
		09/05/77	grab	M2-S-154	56%			- unaerated
		05/17/78	grab	M2-S-28	47%	8.2	2450	- unaerated
		05/17/78	grab	M2-S-29	37%	8.2	2450	
		05/17/78	grab	M2-S-30	23%	8.2	2450	- unaerated
		05/17/78	grab	M2-S-31	59%	8.2	2450	
		05/17/78	grab	M2-S-32	<100%	8.2	2450	- unaerated - 100% killed all fish in 24 hrs.
		05/17/78	grab	M2-S-33	<100%	8.2	2450	- 100% killed all fish in 24 hrs.

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
KRAFT FOODS - Ingleside (SE) (continued)	Lagoon prior to chlorin- ation (cont'd)	10/17/78	grab	M2-S-311	<20%	8.1	2400	- 20% killed all fish in 72 hrs. - unaerated
		10/17/78	grab	M2-S-312	24.5%	8.1	2400	- LC50 range 20-30%
		10/17/78	grab	M2-S-313	32%	8.1	2400	- Treatment I
		10/17/78	grab	M2-S-315	24.5%	8.1	2400	- LC50 range 20-30%
		10/17/78	grab	M2-S-316	33%	8.1	2400	- unaerated
		10/17/78	grab	M2-S-317	N.L.	8.1	2400	- Treatment II
	Plant Outfall to lagoon	09/15/77	grab	M2-S-150	30%	5.0	700	- unaerated - LC50 range 1-5%
		09/15/77	grab	M2-S-155	2.2%	5.0	700	
	Cooling Water Outfall	07/12/77	grab	M2-S-74	N.L.	6.8	205	
	Lagoon after chlorination	07/12/77	grab	M2-S-73	16%	7.9	3000	
LACOURS LUMBER - Lakstock (NE)	Impound Area	09/08/76	grab	M1-S-50	<10%	7.1	780	- 10% killed all fish in 72 hrs. - unaerated
		09/08/76	grab	M1-S-51	70%	7.1	780	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
LINDSAY SEWAGE TREATMENT PLANT - Lindsay (C)	South Outfall	03/06/78 03/06/78	grab grab	S-23 S-37	52% 66%	6.9 7.5	1600 1100	
LUSTER DIVISION NATIONAL HARDWARE SPECIALITIES LTD. - Wallaceburg (SW)	Final Effluent	07/07/75	grab		>100%			- 40% mortality at 100%
MADAWASKA MINES - Bancroft (SE)	Final Ditch	09/19/77	M2-S-153	N.L.	7.7	3750		
MONSANTO - Sarnia (SW)	ABS Plant	10/25/76 10/25/76	grab grab	S-243 S-244	<10% <10%	7.2 7.2	2600 2600	- 10% killed all fish in 48 hrs. - unaerated - "

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
NESTLES - Chesterville (SE)	Lagoon Discharge	07/23/76 07/23/76 08/27/76 07/13/77	grab grab grab grab	M2-S-33 M2-S-38 M2-S-52 M2-S-70	42% N.L.* N.L.* N.L.	7.6 7.6 7.55 7.5	700 700 690 920	- unaerated - * at 56% - * 24 hr unaerated
NORANDA MINES - Manitowadge (NW)	Final Effluent	09/13/77 09/13/77	grab grab	M1-S-131 M1-S-132	39%* <100%	8.8 8.8	3000 3000	- unaerated * 24hr LC50 - 100% killed all fish in 2 hrs.
NORTHERN WOOD PRESERVERS - Thunder Bay (NW)	Final Effluent	08/08/77 08/08/77	grab grab	M1-S-86 M1-S-87	N.L. N.L.	6.7 6.7	290 290	- unaerated
ONTARIO PAPER COMPANY LTD. - Thorold (WC)	Copeland Condensates (inplant sample)	08/13/79	grab	S-134	62%	6.6	180	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
ONTARIO PAPER COMPANY LTD. - Thorold (WC) (continued)	Groundwood White Water (inplant sample)	08/13/79	grab	S-133	24%	4.7	1350	- LC50 range 18-32%
	Na Sulfite white water (inplant sample)	08/13/79	grab	S-131	32%	5.8	710	- LC50 range 18-56%
	Receiving Water (Intake)	01/04/79	grab	S-2	N.L.*	7.4	290	- 24hr LC50 at 100%
		08/13/79	grab	S-132	N.L.	8.2	265	
	Final Effluent	05/17/76	grab	S-88	24%	7.9	1125	- LC50 range 18-32% - unaerated
		05/17/77	grab	S-89	76%	7.9	1125	
		02/28/77	grab	S-31	N.L.	7.2	1020	- 100% killed all fish in 24 hrs.
		01/04/79	grab	S-1	<100%	7.0	1700	
		08/13/79	grab	S-135	N.L.	6.8	345	
PARIS MUNICIPAL TREATMENT PLANT - Paris (WC)	Influent	11/01/76	grab	S-252	1.8%	8.0	990	- LC50 range 1-3% - unaerated
		04/12/77	grab	S-56	14%	9.0	2700	- LC50 range 10-20%
	Effluent	11/01/76	grab	S-253	8%	7.7	1190	- unaerated
		04/12/77	grab	S-55	24%	7.6	2000	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
PENMAN'S TEXTILES - Paris (WC)	Final Effluent	11/01/76	grab	S-251	<1.0%	7.1	1230	- 1% killed all fish in 96 hrs.
PETROSAR - Sarnia (SW)	Final Effluent	07/13/79	grab	M2-S-25	N.L.	7.3	2725	
P.L. ROBERTSON - Milton (C)	Final Effluent	09/02/75	grab		N.L.			
POLYSAR - Sarnia (SW)	66" Main Sewer	04/13/76	grab	S-56	75%	7.5	480	- LC50 range 50-100%
		06/14/76	grab	S-105	32%	7.6	540	
		06/14/76	grab	S-114	<100%	7.6	540	- 100% killed all fish in 24 hrs-stored tightly covered at 4°C
		06/14/76	grab	S-115	<100%	7.6	540	- 100% killed all fish in 24 hrs-stored uncovered at 4°C
		06/14/76	grab	S-116	<100%	7.6	540	- 100% killed all fish in 1.5 hrs - stored tightly covered at 15°C
		06/14/76	grab	S-117	<100%	7.6	540	- 100% killed all fish in 24 hrs - stored uncovered at 15°C

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
POLYSAR - Sarnia (SW)	66" Main Sewer (cont'd)	07/26/76	grab	S-171	>100%	7.6	550	- unaerated - 10% mortality at 100%
		07/26/76	grab	S-173	N.L.	7.6	550	
		07/26/76	grab	S-174	N.L.	7.6	550	- under an O ₂ atmosphere
		07/26/76	grab	CF-3	100%	7.6	550	- continuous flow 25% mortality at 100%
		08/23/76	grab	S-188	40%	7.6	890	- unaerated
		08/22/76	grab	S-190	35%	7.7	680	- unaerated
		08/22/76	grab	S-191	59%	7.7		
		08/22/76	grab	S-192	43.5%	7.7	680	- unaerated - O ₂ head treated
	Stereo API Separator	03/02/76	grab	S-12	8.4%			
		06/14/76	grab	S-106	7.6%			
		06/14/76	grab	S-112	<3.2%	7.2	155	- 90% mortality at 3.2%
		07/26/76	grab	S-175	16%	7.35	160	
		07/26/76	grab	S-176	11%	7.35	160	- unaerated
		08/23/76	grab	S-189	<100%	7.7	180	- 90% mortality at 100%
	Esso/Polysar boundary (St. Clair River)	06/14/76	grab	S-108	N.L.	8.35	175	
	72" Sewer	06/14/76	grab	S-107	N.L.	7.45	205	
	Hwy 40 Ditch (end)	06/14/76	grab	S-110	>100%	8.35	200	- 10% mortality at 100%
	54" Sewer	04/13/76	grab	S-57	N.L.	7.9	210	
		06/14/76	grab	S-111	>100%	7.85	230	- 10% mortality in 100%

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
POLYSAR - Sarnia (SW) (continued)	Service Water	07/14/76	grab	S-109	N.L.	8.1	180	
		07/26/76	grab	S-172	>100%	7.6	550	- 10% mortality in 100%
		07/27/76	grab	S-173(B)	>100%			- 10% mortality in 100% unaerated
		08/22/76	grab	S-193	N.L.	7.6	180	- unaerated
		11/01/76	grab	S-249	N.L.	7.9	200	
		11/01/76	grab	S-250	N.L.	7.8	200	- unaerated
REED LTD. - Dryden Division (NW)	Final Effluent	08/04/77	grab	M1-S-85	21%	9.6	450	
REICHOLD CHEMICAL - Thunder Bay (NW)	Final Effluent	08/02/77	grab	M1-S-83	<10%	7.9	1500	- unaerated - 10% killed all fish in 20 hrs.
		08/02/77	grab	M1-S-84	<100%	7.9	1500	- 100% killed all fish in 4 hrs.
		09/07/77	grab	M1-S-123	N.L.	8.0	860	- unaerated
		09/07/77	grab	M1-S-124	N.L.	8.0	860	- unaerated

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
RIO ALGOM MINES MILLIKEN-STANLEIGH MINES - Crotch Lake (NE)	Effluent from Crotch Lake Plant (CL-02)	06/20/79	grab	S-62	N.L.	13.3	5600	- unaerated - pH adjusted to 7.8
		06/20/79	grab	S-82	7.5%	13.3	5600	- unaerated
	Feed to Crotch Lake Treat- ment Plant (CL-01)	06/20/79	grab	S-61	N.L.	2.1	1400	- unaerated - pH adjusted to 7.9
	Crotch Lake Outlet (CL-04)	08/23/76	grab	M1-S-39	N.L.	7.3	330	- unaerated
		06/20/77	grab	M1-S-34	N.L.	7.1	260	
		06/20/77	grab	M1-S-33	N.L.	7.1	260	- unaerated
		06/19/79	grab	S-63	N.L.	7.6	295	- unaerated
		08/22/79	grab	S-142	N.L.	7.6	280	- unaerated
RIO ALGOM NORDIC PROPERTY - Elliot Lake (NE)	Serpent R. at Hwy 17	08/22/79	grab	S-157	N.L.	7.2	165	- unaerated
	North Nordic Lake Effluent (N-19)	06/19/79 08/22/79	grab grab	S-66 S-145	N.L. N.L.	8.2 7.3	1220 1310	- unaerated - unaerated

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
RIO ALGOM MINES NORDIC PROPERTY - Elliot Lake (NE)	Effluent from Nordic Treatment Plant (N-18)	06/19/79	grab	S-65	46%	12.4	2500	- unaerated LC50 range 30-70% pH adjusted to 7.8
		06/19/79	grab	S-83	24%	12.4	2500	- unaerated LC50 range 20-30%
		08/22/79	grab	S-143	26.3%	11.7	2150	
		08/22/79	grab	S-144	<100%	11.7	2150	- unaerated pH adjusted to 8.2
	Feed to Nordic Treatment Plant (N-17)	06/19/79	grab	S-64	N.L.	2.1	2000	- pH adjusted to 7.6 unaerated
	Buckles Creek at Hwy 108	08/30/76	grab	M1-S-41	>100%	6.0	920	- unaerated - 30% mortality in 100%
		07/11/77	grab	M1-S-47	N.L.	6.9	1050	- unaerated
		07/11/77	grab	M1-S-48	N.L.	6.9	1050	
	Strike Lake Effluent	09/07/76	grab	M1-S-44	20%	3.9	430	- unaerated
		09/07/76	grab	M1-S-45	>100%	3.9	430	- unaerated pH adjusted to 7.0 10% mortality in 100%
		06/20/77	grab	M1-S-35	>100%	4.5	425	- unaerated 30% mortality in 100% pH adjusted to 7
		06/20/77	grab	M1-S-36	<100%	4.5	425	- 100% killed all fish in 33 hrs.

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
RIO ALGOM MINES PRONTO PROPERTY - Elliot Lake (NE)	Pronto Effl. at Hwy 17 (PR-01)	08/16/76	grab	M1-S-37	N.L.	6.5	470	
		07/11/77	grab	M1-S-45	N.L.	6.9	560	- unaerated
		07/11/77	grab	M1-S-46	N.L.	6.9	560	
		06/21/79	grab	S-67	N.L.	6.4	660	- unaerated
		08/22/79	grab	S-146	N.L.	7.0	405	- unaerated
	Treated Effl. leaving Treat- ment Plant (PR-03)	06/19/79	grab	S-69	N.L.	12.1	1340	- pH adjusted to 7.8 unaerated
		06/19/79	grab	S-84	N.L.*	12.1	1340	- unaerated * at 30%
		06/19/77	grab	S-92	N.L.*	12.1	1340	- unaerated * at 50%
	Treated Effl. O/F settling area (PR-04)	06/19/79	grab	S-70	N.L.	11.5	840	- unaerated pH adjusted to 7.8
	Feed to Pronto Treatment Plant (PR-02)	06/19/79	grab	S-68	N.L.	2.2	980	- pH adjusted to 7.8 unaerated
RIO ALGOM MINES QUIRKE PROPERTY - Elliot Lake (NE)	Dunlop Lake at Pumphouse (Q-19)	06/20/79	grab	S-75	N.L.	7.6	35	- unaerated
		08/22/79	grab	S-156	N.L.	7.9	38	- unaerated

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
RIO ALGOM MINES QUIRKE PROPERTY - Elliot Lake (NE)	Quirke Mine (Q-05)	08/22/79	grab	S-147	17%	9.8	2050	- unaerated LC50 range 10-30%
		08/22/79	grab	S-148	N.L.	9.8	2050	- unaerated Dowex resin treated for removal of ammonia
		08/22/79	grab	S-159	< 100%	9.8	2050	- unaerated pH adjusted to 8.5 - 100% killed all fish in 24 hrs.
	Serpent River at Rio Algom railroad	06/20/79	grab	S-76	N.L.	8.6	580	- unaerated
	Serpent River below effluent addition, at flow station (Q-09)	06/20/79	grab	S-74	N.L.	8.5	720	- unaerated
		08/22/79	grab	S-155	N.L.	7.0	1040	- unaerated
	Serpent River above effluent addition, at Mine Rd. (Q-08)	06/20/79	grab	S-73	N.L.	8.0	305	- unaerated
		08/22/79	grab	S-154	N.L.	7.6	2000	- unaerated
	Tailings Effluent to	06/20/79	grab	S-72	N.L.	10.3		- unaerated pH adjusted to 7.6
	Serpent River at Hwy 108 (Q-06)	06/20/79	grab	S-85	N.L.*	10.3		- unaerated * at 30%
		06/20/79	grab	S-93	> 70%	10.3		- unaerated
		08/22/79	grab	S-152	N.L.	7.0	2000	- unaerated

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
RIO ALGOM MINES QUIRKE PROPERTY - Elliot Lake (NE) (continued)	Tailings Effluent after treat- ment (Q-3)	07/11/77	grab	M1-S-43	>100%*	7.7	2400	- unaerated * 24 hr LC50 20% mortality in 100%
		07/11/77	grab	M1-S-44	100%	7.7	2400	
		06/20/79	grab	S-71	<100%	11.4	2200	- unaerated pH adjusted to 7.8 100% killed all fish in 48 hrs.
		06/20/79	grab	S-89	N.L.*	11.4	2200	- unaerated * at 50%
	Dam Effluent at Quirke	08/22/79	grab	S-150	N.L.	7.6	2400	- unaerated
		08/30/76	grab	M1-S-40	<10%	7.0	2200	- 80% mortality in 10% unaerated
ROHM & HAAS - Norrisberg (SE)	Cooling Water	07/12/77	grab	M2-S-68	N.L.	7.2	310	
SHELL CANADA - Corunna (SW)	Cooling Water	05/29/79	grab	S-42	N.L.*	8.1	490	- * 24 hr test

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
SHELL CANADA - Corunna (SW) (continued)	Total Effl. (API separator, Biological oxidation and storm water combined according to flow)	07/12/76	3-gr comb. "	S-153	N.L.	7.7	250	- unaerated
		05/29/79		S-44	N.L.*	8.0	340	- * 24 hr test
	Intake (Service Water)	07/12/76	grab grab	S-149	N.L.	8.3	205	- unaerated
		05/29/79		S-43	N.L.*	8.4		- * 24 hr test at 100%
- Oakville (WC)	Final holding pond	07/28/75	grab		N.L.			- continuous flow
		06/11/79	grab	S-57	N.L.	7.8		
		06/11/79	grab	S-59	N.L.*	7.7		- * 24 hr LC50
SHERMAN MINE - Temagami (NE)	1/4 mile below Weir on Tetapaga R.	06/29/76	grab	M1-S-14	N.L.	7.5	480	- unaerated
		07/20/77	grab	M1-S-67	> 100%	2.9	2500	- pH adjusted to 6.3 30% mortality in 100%
	South Pit	07/20/77	grab	M1-S-68	< 100%	2.9	2500	- 100% killed 11 fish in 1.5 hrs.

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
SHERMAN MINE - Temagami (NE) (continued)	Mine Effluent	09/20/76	grab	M1-S-66	N.L.	8.3	580	- unaerated
SKYWAY SEWAGE TREATMENT PLANT - Burlington (C)	Before Chlorination	10/04/76	grab	S-212	>100%	7.9	740	- 10% mortality in 100%
SPRUCE FALLS POWER & PAPER CO. - Kapuskasing (NE)	Red liquor stream (inplant sample)	11/19/79	grab	S-201	1.0%	3.1	2750	
	Condensate stream (inplant sample)	11/09/79	grab	S-200	2.3%	1.8	5400	
	Magnafite stream (inplant sample)	11/19/79	grab	S-202	13%	2.65	1160	- LC50 range 9-18%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
SPRUCE FALLS POWER & PAPER CO. LTD. - Kapuskasing (NE) (continued)	TMP chip washer (inplant sample)	07/15/78 07/15/78	grab grab	S-84 S-89	0.9% 1.7%	5.0 5.0	160 160	- pH adjusted to 6.5
	TMP stock liquor (inplant sample)	07/15/78	grab	S-86	2.3%	6.2	70	
	Groundwood mill stock liquor (inplant sample)	05/19/77	grab	M1-S-2	14%	6.8	79	- LC50 range 10-20%
	Chip Washer water (inplant sample)	06/14/77	grab	M1-S-27	<2%	5.3	155	- 2% killed all fish in 12 hrs.
	4th Stage reject liquor (inplant sample)	06/14/77 07/15/78 07/15/78	grab grab grab	M1-S-26 S-85 S-88	<2% 3.6% 11.8%	5.4 2.3 2.3	160 540 540	- 2% killed all fish in 24 hrs. - pH adjusted
	Warmwater intake to TMP (inplant sample)	07/15/78	grab	M1-S-28	N.L.	7.5	108	

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
SPRUCE FALLS POWER & PAPER CO. LTD. - Kapuskasing (NE) (continued)	Pulp Stock - no bleach (inplant sample)	06/15/77	grab	M1-S-29	2%	6.3	140	
	Pulp Stock - with bleach (inplant sample)	06/15/77	grab	M1-S-30	<2%	5.2	240	- 80% mortality in 2%
	Process Warm- water (inplant sample)	07/15/78	grab	S-83	>100%	7.9	85	- 10% mortality in 100%
	Main Mill Effluent	07/06/76	grab	M1-S-16	22%	6.3	1400	- unaerated
		07/06/76	grab	M1-S-17	42%	6.3	1400	- LC50 range 32-56%
		07/20/76	grab	M1-S-20	14%	3.8	510	- unaerated LC50 range 10-20%
		07/20/76	gran	M1-S-21	14%	3.8	510	- " "
		09/20/76	grab	M1-S-63	<10%	3.7	530	- unaerated 30% mortality in 10%
		09/20/76	grab	M1-S-64	<10%	3.7	530	- 10% killed all fish in 96 hrs.
		08/27/79	grab	S-170	24%	4.0	560	- LC50 range 17.5-32.5%
		11/19/79	grab	S-203	37%	6.0	486	
	Groundwood whitewater overflow (inplant sample)	05/19/77	grab	M1-S-1	N.L.	6.4	148	
		08/27/79	grab	S-171	47.7%	4.9	355	- CL50 range 32.5-70%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
SPRUCE FALLS POWER & PAPER CO. LTD. - Kapuskasing (NE) (continued)	TMP Final Effluent (inplant sample)	07/15/78	grab	S-87	3.2%	6.0	140	- LC50 range 2-5%
		08/27/79	grab	S-173	1.2%	5.0	415	
	Ca sulfite effluent (inplant sample)	08/27/79	1 gr. every 5 min over 1h 20 min	S-172	3.5%	2.2	4150	- pH adjusted to 8.0
		08/27/79	"	S-175	<10%	2.2	4150	
	Intake (Service Water)	08/27/79	grab	S-174	N.L.	7.7	110	
STELCO - Hamilton (WC)	West Side Open Cut Sewer	06/23/69	grab	69-37	3.9%			- unaerated
		08/25/75	grab	69-37	3.0%			red belly dace used
		08/25/75	grab	69-37	2.4%			- unaerated
		09/09/75	grab	69-37	4.2%			- unaerated
		04/05/76	grab	S-50	2.2%	7.35	780	- unaerated
		06/06/77	grab	S-99	8.5%	7.7	470	
		01/12/78	grab	CF-2	1.4%	7.5	720	- continuous flow bioassay
		01/12/78	grab	S-7	0.7%	6.6	750	LC range 1-2%
		01/12/78	grab	S-9	1.1%	7.5	720	
		03/13/78	grab	S-36	3.8%	8.2	560	
		05/24/78	24hr comp.	M2-S-35	7.0%	7.32	518	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
STELCO - Hamilton (WC) (continued)	West Side Open Cut Sewer (cont'd)	05/25/78	24hr comp.	M2-S-39	N.L.*	7.9	740	- * at 60%
		05/26/78	24hr comp.	M2-S-43	N.L.	8.0	640	
		05/30/78	24hr comp.	M2-S-47	N.L.	7.7	640	
		05/31/78	24hr comp.	M2-S-53	N.L.	7.65	630	
		06/01/78	24hr comp.	M2-S-57	N.L.	7.45	440	
		06/06/78	24hr comp.	M2-S-61	49%	7.6	550	- LC50 range 40-60%
		06/07/78	24hr comp.	M2-S-66	N.L.	7.25	600	
		06/08/78	24hr comp.	M2-S-71		7.7	600	
		06/13/78	24hr comp.	M2-S-78	35%	7.98	580	
		06/13/78	grab	M2-S-83	1.7%	7.5	560	
		06/14/78	24hr comp.	M2-S-86	17.2%	8.15	560	- LC50 range 10-30%
		06/13/78	grab	M2-S-99	1.4%	7.7	440	- LC50 range 1-2%
		06/13/78	grab	M2-S-121	N.L.*			- * at 10%
		06/13/78	grab	M2-S-122	N.L.*			- Effluent renewed every 48 hrs - * at 5%
		06/13/78	grab	M2-S-123	N.L.*			- Effluent renewed every 24 hrs - * at 10%
		06/13/78	grab	M2-S-178	2.2%			
		06/15/78	24hr comp.	M2-S-91	9.4%	8.05	660	
		06/16/78	24hr comp.	M2-S-95	N.L.	7.3	620	
		06/17/78	24hr comp.	M2-S-97	N.L.	7.6	440	
		06/18/78	24hr comp.	M2-S-100	N.L.	7.35	610	
		06/19/78	24hr comp.	M2-S-104	N.L.	7.45	605	
		06/19/78	24hr comp.	M2-S-106	>100%	8.0	620	- 40% mortality in 100%
		06/20/78	24hr comp.	M2-S-108	N.L.	7.8	610	
		06/21/78	24hr comp.	M2-S-113	<100%	7.95	620	- 20% mortality in 100%

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DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
STELCO - Hamilton (WC) (continued)	North West Outfall	05/30/78	24hr comp.	M2-S-50	3.7%	8.8	590	- LC50 range 3-5%
		05/31/78	24hr comp.	M2-S-54	17%	8.05	590	
		06/01/78	24hr comp.	M2-S-58	N.L.	7.45	405	
		06/03/78	24hr comp.	M2-S-63	N.L.	7.4	550	
		06/07/78	24hr comp.	M2-S-68	N.L.	7.5	540	
		06/08/78	24hr comp.	M2-S-73	<75%	8.4	610	
								- 75% killed all fish in 24 hrs
		06/13/78	24hr comp.	M2-S-80	N.L.	7.4	530	
		06/14/78	24hr comp.	M2-S-88	N.L.	7.6	500	
		06/15/78	24hr comp.	M2-S-93	72%	8.4	560	
		06/17/78	24hr comp.	M2-S-98	N.L.	7.95	415	- LC50 range 50-100%
		06/18/78	24hr comp.	M2-S-101	N.L.	8.25	600	
		06/19/78	24hr comp.	M2-S-105	N.L.	7.85	565	
		06/20/78	24hr comp.	M2-S-109	N.L.	7.7	580	
		06/22/78	24hr comp.	M2-S-119	N.L.	7.8	580	
		06/27/78	24hr comp.	M2-S-126	7.2%	9.1	640	
		06/28/78	24hr comp.	M2-S-133	13.1%	8.7	600	- LC50 range 5-10%
		06/29/78	24hr comp.	M2-S-136	32%	8.3	610	
		07/05/78	24hr comp.	M2-S-145	78%	8.37	520	
		07/06/78	24hr comp.	M2-S-149	0.88%	9.25	620	- LC50 range 20-50%
		07/11/78	24hr comp.	M2-S-158	7.7%	8.4	620	
		07/12/78	24hr comp.	M2-S-167	14%	7.9	635	
		07/13/78	24hr comp.	M2-S-172	<20%	7.4	615	- LC50 range 60-100%
								- LC50 range 0.75-1%
								- LC50 range 5-10%
								- LC50 range 10-20%
								- 20% killed all fish in 96 hrs.
		07/17/78	24hr comp.	M2-S-179	3.1%			- Lc50 range 2-5%

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
STELCO - Hamilton (WC)	#2 Pumphouse	05/24/78	24hr comp.	M2-S-37	100%	8.1	510	
		05/25/78	24hr comp.	M2-S-41	N.L.	8.2	580	
		05/26/78	24hr comp.	M2-S-45	N.L.	8.4	570	
		05/30/78	24hr comp.	M2-S-49	N.L.	8.05	580	
		05/31/78	24hr comp.	M2-S-52	N.L.	8.15	525	
		06/01/78	24hr comp.	M2-S-56	N.L.	8.05	380	
		06/06/78	24hr comp.	M2-S-60	N.L.	7.9	520	
		06/07/78	24hr comp.	M2-S-65	N.L.	7.5	520	
		06/08/78	24hr comp.	M2-S-70	N.L.	8.0	510	
		06/13/78	24hr comp.	M2-S-77	N.L.	8.25	480	
		06/14/78	24hr comp.	M2-S-85	N.L.	8.2	565	
		06/15/78	24hr comp.	M2-S-90	N.L.	7.7	510	
		06/16/78	24hr comp.	M2-S-94	N.L.	8.25	500	
		06/17/78	24hr comp.	M2-S-96	N.L.	7.3	490	
		06/18/78	24hr comp.	M2-S-102	N.L.	7.55	520	
		06/19/78	24hr comp.	M2-S-103	N.L.	7.9	510	
		06/20/78	24hr comp.	M2-S-107	N.L.	8.5	540	
		06/21/78	24hr comp.	M2-S-112	N.L.	7.8	560	
		06/22/78	24hr comp.	M2-S-117	N.L.	7.6	540	
		07/11/78	24hr comp.	M2-S-156	N.L.	8.5	490	
		07/12/78	24hr comp.	M2-S-165	N.L.	7.5	540	
		07/13/78	24hr comp.	M2-S-170	N.L.	7.35	525	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
STELCO - Hamilton (WC)	#3 Open Hearth	05/24/78	24hr comp.	M2-S-34	N.L.	8.4	540	- 10% mortality in 100%
		05/25/78	24hr comp.	M2-S-38	N.L.	8.25	620	
		05/26/78	24hr comp.	M2-S-42	>100%	8.1	550	
		05/30/78	grab	M2-S-46	N.L.	7.95	560	
		06/06/78	24hr comp.	M2-S-62	N.L.	7.6	510	
		06/07/78	24hr comp.	M2-S-67	N.L.	7.5	540	
		06/08/78	24hr comp.	M2-S-72	N.L.	7.5	500	
		06/13/78	24hr comp.	M2-S-79	N.L.	8.17	495	
		06/14/78	24hr comp.	M2-S-87	N.L.	8.45	475	
		06/15/78	24hr comp.	M2-S-92	N.L.	7.55	540	
		06/20/78	24hr comp.	M2-S-110	N.L.	7.2	540	
		06/21/78	24hr comp.	M2-S-115	N.L.	8.0	525	
		06/22/78	24hr comp.	M2-S-120	N.L.	7.6	540	
		06/27/78	24hr comp.	M2-S-127	N.L.	8.0	570	
		06/28/78	24hr comp.	M2-S-134	N.L.	8.1	560	
		06/29/78	24hr comp.	M2-S-137	N.L.	8.2	560	
		07/05/78	24hr comp.	M2-S-143	N.L.	8.05	540	
		07/06/78	24hr comp.	M2-S-147	N.L.	7.95	580	
		07/07/78	24hr comp.	M2-S-150	N.L.	7.4	500	
		07/11/78	24hr comp.	M2-S-157	N.L.	7.55	520	
		07/12/78	24hr comp.	M2-S-166	N.L.	7.25	510	
		07/13/78	24hr comp.	M2-S-171	N.L.	7.2	520	
	Rolling Mill Cooling Water	07/11/78	grab	M2-S-163	N.L.	8.5	550	
		07/17/78	grab	M2-S-173	N.L.	7.09	540	

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
STELCO - Hamilton (WC) (continued)	Filtration Outfall (East Side)	06/27/78	grab	M2-S-130	N.L.	7.75	560	
		07/11/78	grab	M2-S-161	N.L.	7.95	540	
		07/17/78	grab	M2-S-177	N.L.	7.05	520	
		07/18/78	grab	M2-S-184	N.L.	7.35	565	
		07/19/78	grab	M2-S-188	N.L.	6.9	525	
	#1 Pumphouse	05/24/78	24hr comp.	M2-S-36	N.L.	8.1	455	
		05/25/78	24hr comp.	M2-S-40	N.L.	8.45	605	
		06/25/78	24hr comp.	M2-S-44	N.L.	8.55	510	
		05/30/78	24hr comp.	M2-S-48	N.L.	8.45	580	
		05/31/78	24hr comp.	M2-S-51	N.L.	8.37	580	
		06/01/78	24hr comp.	M2-S-55	N.L.	8.15	370	
		06/06/78	24hr comp.	M2-S-59	N.L.	8.3	510	
		06/07/78	24hr comp.	M2-S-64	N.L.	8.1	510	
		06/08/78	24hr comp.	M2-S-69	N.L.	7.85	515	
		06/13/78	24hr comp.	M2-S-76	N.L.	7.9	500	
		06/14/78	24hr comp.	M2-S-84	N.L.	8.0	510	
		06/15/78	24hr comp.	M2-S-89	N.L.	8.15	515	
		06/20/78	grab	M2-S-111	N.L.	7.3	540	
		06/27/78	24hr comp.	M2-S-124	N.L.	8.45	560	
		06/29/78	24hr comp.	M2-S-138	N.L.	8.6	580	
		07/05/78	24hr comp.	M2-S-142	N.L.	7.9	550	
		07/07/78	24hr comp.	M2-S-146	N.L.	7.3	480	
		07/11/78	24hr comp.	M2-S-155	N.L.	8.75	505	
		07/12/78	24hr comp.	M2-S-164	N.L.	7.4	545	
		07/13/78	24hr comp.	M2-S-169	N.L.	7.3	540	

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
STELCO - Hamilton (WC) (continued)	Combined Lagoon (East side lagoon, filter plant & Depeu St. sewers)	06/28/78	grab	M2-S-128	N.L.	7.9	580	
		07/11/78	grab	M2-S-162	N.L.	7.9	520	
		07/17/78	grab	M2-S-175	N.L.	5.8	560	
		07/18/78	grab	M2-S-182	N.L.	7.4	570	
		07/19/78	grab	M2-S-186	N.L.	6.8	525	
	Depeu Street Sewer	06/27/78	grab	M2-S-131	N.L.	7.05	620	
		07/11/78	grab	M2-S-159	N.L.	7.43	540	
		07/17/78	grab	M2-S-174	44%	2.4	1180	- LC50 range 40-50%
		07/18/78	grab	M2-S-181	62%	6.3	580	- LC50 range 40-100%
		07/19/78	grab	M2-S-185	N.L.	6.5	540	
	Filtration (East Side)	06/27/78	grab	M2-S-129	N.L.	8.3	560	
		07/11/78	grab	M2-S-160	N.L.	7.7	540	
		07/11/78	grab	M2-S-176	N.L.	6.75	550	
		07/18/78	grab	M2-S-183	N.L.	8.35	570	
		07/19/78	grab	M2-S-187	N.L.	6.9	525	
	Lagoon Discharge	04/05/78	grab	S-49	75%	7.6	450	- unaerated LC50 range 56-100%

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
STELCO - Hamilton (WC)	Intake (Service Water)	06/06/78	grab	S-96	N.L.	8.0	430	
	North Trunk Sewer	09/09/78	grab		56%			- unaerated
		05/10/76	grab	S-83	N.L.	7.3	500	LC50 range 32-100%
		06/06/78	grab	S-97	N.L.	8.1	480	- unaerated
	Coke Oven byproducts recovery area	06/06/77	grab	S-100	N.L.	8.1	430	
	East Side Lagoon	06/23/69	grab	69-25	N.L.			- red belly dace used
		08/25/75						unaerated
		06/06/77	grab	S-98	N.L.	8.0	460	- red bell dace used
		06/06/77	grab	S-102	N.L.	7.6	440	unaerated
								- filter building
	E Blast Furnace Thickener Overflow	grab	06/06/77	S-103	75.7%	7.6	740	

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCT- TIVITY	COMMENTS
STELCO - Hamilton (WC) (continued)	Hot Strip Finishing Mill - black water	04/05/76 05/10/76 06/06/77	grab grab grab	S-47 S-82 S-104	62% 32% N.L.	7.1 11.4 8.7	620 915	- unaerated - unaerated
	B,C, & D Blastfurnace Thickener	09/09/75 04/05/76 06/06/77 01/12/78 01/12/78 01/12/78 03/13/78	grab grab grab grab grab grab	S-51 S-101 S-6 S-8 S-10 S-35	1.3% 0.86% 4.2% 5.6% 0.7% >10%* 0.7%	7.1 7.4 7.4 7.7 7.7 8.0	650 540 750 700 1745 920	- unaerated - unaerated - LC50 range 1-10% - LC50 range 0.5-1% - *48 hr test - 10% dead in 10% - OC50 range 0.5-1%
STRATHCONA PAPER CO. LTD. - Strathcona (SE)	Lagoon /9 (Discharge to Napanee River)	06/07/76	grab	M2-S-4	45%	6.2	580	- unaerated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
STRATHCONA PAPER CO. LTD. - Strathcona (SE) (continued)	Lagoon #7 (Discharge to Napanee River)	06/07/76	grab	M2-S-5	22%	6.7	525	- unaerated
		09/13/76	grab	M2-S-63	24%	6.1	510	- unaerated
		07/06/77	grab	M2-S-59	N.L.	6.5	490	
	Spray Field Runoff	07/12/76	grab	M2-S-26	90%	7.5	440	- unaerated
		05/30/77	grab	M2-S-5	N.L.	6.7	640	
		06/06/77	grab	M2-S-58	N.L.	6.4	620	
SUN OIL - Sarnia (SW)	Total Effluent	07/12/76	grab	S-152	N.L.	7.8	500	- unaerated
		05/29/79	grab	S-45	N.L. *	8.1	500	- * 24hr test
	Intake (Service Water)	07/12/76	grab	S-147	N.L.	8.3	420	- unaerated
		05/29/79	grab	S-46	N.L.*	8.4	425	- * 24hr test

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
TECK CORP. - Cart Lake (NE)	Outlet at Cart Lake	07/20/77 07/02/77	grab grab	M1-S-65 M1-S-66	N.L. N.L.	7.3 7.3	335 335	- unaerated
TEXACO - Nanticoke (WC)	Final Holding Pond	06/04/79 06/04/79	grab grab	S-53 S-54	N.L.* N.L.	8.9 8.9	4450 4450	- *24 hr test
TEXAGULF - Porcupine R. (NE)	Discharge to Porcupine River	08/09/76	grab	M1-S-34	N.L.	6.1	1200	- unaerated
TRANSPARENT CELLULOSE FILM (T.C.F.) - Cornwall (SE)	Sulfide Sewer (#1 Sewer)	08/10/76 06/27/77 06/27/77 08/16/77 08/16/77 04/24/79	grab grab grab grab grab grab	M2-S-41 M2-S-43 M2-S-53 M2-S-113 M2-S-120 S-36	26% 20% <15% 45% 23% 44.3%	8.75 9.6 9.6 8.9 8.9 9.2	2000 1900 1900 1950 1950 2100	- unaerated - pH adjusted to 7.0 - 15% killed all fish in 1 hr. - LC50 range 40-50% - pH adjusted to 6.9

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
TRANSPARENT CELLULOSE FILM (T.C.F.) - Cornwall (SE) (continued)	Acid Sewer (#3 Sewer)	08/06/76	grab	M2-S-53	4.2%	1.7	9300	- unaerated
		06/27/77	grab	M2-S-45	6.0%	1.3	12000	- LC50 range 5-7%
		06/27/77	grab	M2-S-51	>100%	1.3	12000	- 20% mortality in 100% pH adjusted to 7.0
		04/24/79	grab	S-34	1.3%	1.2	16000	- LC50 range 0.5-2%
		04/24/79	grab	S-35	8.9%	1.2	16000	- pH adjusted to 7.8
	#2 Sewer	06/27/77	grab	M2-S-44	N.L.	7.9	1300	
		08/16/77	grab	M2-S-114	N.L.	7.9	1500	
TRENT VALLEY PAPERBOARD MILLS - Glen Miller (SE)	Final Effluent	06/14/76	grab	M2-S-9	50%	7.35	230	
		09/13/76	grab	M2-S-62	85%	7.7	225	- unaerated
		06/06/77	grab	M2-S-60	>100%	7.1	240	- 10% mortality in 100%
TRICIL - Sarnia (SW)	Total Discharge	04/18/77	grab	S-64	22%	8.5	2600	

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
UNION CARBIDE - Lindsay (C)	Discharge Pipe	02/16/76	grab	S-4	18%			- LC50 range 10-32%
		03/08/76	grab	S-17	11.2%			
	Intake (Service Water)	02/15/77	grab	S-21	N.L.	7.7	440	
		03/06/78	grab	S-22	N.L.	8.2	600	
	Clarifier decant (Final)	02/15/77	grab	S-22	23%	8.7	5220	
		02/15/77	grab	S-25	> 100%	8.0	6800	- 5% mortality in 100% unaerated clin. treated
		02/15/77	grab	S-26	N.L.	8.0	6800	- clin. treated
		02/15/77	grab	S-27	39%	7.5	4200	- LC50 range 30-50% stored in 13 days
		03/06/78	grab	S-20	35%	8.9	5200	
		03/06/78	grab	S-21	23.5%*	8.9	5200	- unaerated * 24 hr test
		03/06/78	grab	S-28	37%	8.4	2400	- stored 10 days
		03/06/78	grab	S-29	10%	8.4	2400	- stored 10 days - unaerated 10% killed all fish in 96 hrs.
		03/06/78	grab	S-30	74%	8.9	4950	- clin. treated
		04/14/78	grab	S-41	34%	8.3	5200	
		04/14/78	grab	S-42	N.L.	8.3	5200	- clin. treated

DATA SUMMARY SHEET

COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIV- TIVITY	COMMENTS
UNIROYAL - Elmira (WC)	Influent (Carbon Filter)	09/20/76	grab	S-198	6%	8.0	20000	- LC50 range 5-7%
		04/12/77	grab	S-60	3.9%	8.5	33000	- LC50 range 3-5%
	Effluent (Carbon Filter)	09/20/76	grab	S-199	45%	8.4	20000	- pH adjusted to 6.6 LC50 range 20-30%
		04/12/77	grab	S-200	24%	8.4	20000	
WINDSOR CHROME PLATING - Windsor (SW)	Final Effluent	08/18/75 08/18/75	grab grab	N.L. 64%				- LC50 range 56-75% pH of final effluent = 9.2
ZEPHYR TEXTILES - Almonte (SE)	Main Mill Outfall	09/07/77	grab	M2-S-147	15.5%	5.9	2800	
	Cooling Water	06/21/77	grab	M2-S-38	N.L.	8.1	165	

DATA SUMMARY SHEET

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COMPANY NAME and LOCATION	EFFLUENT	SAMPLE DATE M/ D/ Y	SAMPLING METHOD	TEST NO.	96-HOUR -LC 50	pH	CONDUCTIVITY	COMMENTS
ZEPHYR TEXTILES - Almonte (SE) (continued)	Dye Vat Overflow	06/21/77	grab	M2-S-39	N.L.	8.2	165	
	Drainage Ditch	08/24/76	grab	M2-S-49	<10%	6.45	610	- 10% killed all fish 33 hrs.